

Lst. Software (BBC VERSIONS AVAILABLE) PRESENTS A SELECTION OF HARDWARE, UTILITIES & SOFTWARE FOR THE ELECTRON

VINE MICROS ADDCOM R.R.P. £28.00

OUR PRICE £25.00

ELITE'S BOMBJACK RRP. £9.95 DUR PRICE £8.45

NUTS TO ACORN (SILLY PRICES) £1.99 BOXER STARSHIP COMMAND £2.99 £2.99 £2.99 **BUSINESS GAMES** DESK DIARY £2.99 £2.99 £2.99 £2.99 SPHYNX ADV ARCADIANS TREE/KNOWLEDGE €2.99 SNAPPER HOPPER PERS. MONEY MAN. £2.99 £2.99 PHILOSOPHER'S QUEST £3.99 £3.99 MUNSTERS **CRAZY TRACER** £2.99 PLANETOID £2.99 £2.99 WORD HUNT ME & MY MICRO CASS & BOOK

PLUS 3 OWNERS DISC **BLUE RIBBONS ELECTRON GAMES** Five Games: Nightmare Maze, Castle Assault, Diamond Mine, Astro Plumber, Diamond Mine II R.R.P. £9.95 OUR PRICE 8.95

SLOGGER ROMBOXES ROMBOX R.R.P. £44.95 OUR PRICE £41.95 ROMBOX - P Built in Centronics Printer Interface + Free Printer RDM. R.R.P. £59.95 OUR PRICE £64.95

IMAGINE'S New MIKIE (CONVERTED FROM SPECTRUM) R.R.P. £8.95 OUR PRICE £7.95

SUPERIOR SOFTWARE'S SMASH PACK 3 CASSETTES Centibug (Shoot the Centipede) Percy Penguin (Crush the Snowbees) Zery Kong Jnr. (Climb the vine leaves — watch out for the snappers! Fantastic value All 3 for just £7.951

The Micropower POWER PACK!! 3 Cassettes: FRENZY — Trap the nuclear particles THE MINE Watch out for Dragons whist

collecting the money
CROAKER Help Kermit across the road and river
— save him from becoming frogs legs
All 3 for £5.95 ONLY!!

A.S.L. PSYCASTRIA R.R.P. £7.95 OUR PRICE £6.50

THRUST (No. 1 Commodore Game newly converted) R.R.P. £7.95 OUR PRICE £6.75

SUPERIOR'S

TYNESOFT'S COMMONWEALTH GAMES (8 EVENTS) R.R.P. £7.95 OUR PRICE £6.50 DRAG RACING RRP. £6.95 OUR PRICE £5.95

THIS MONTH'S SPECIALS **ENDS 31st AUGUST** STAIRWAY TO HELL ONLY £8.95 FRAK ONLY £5.90 EDDIE KIDD ONLY £5.95

SLOGGER SOFTWARE ROMS ELKMAN RRP. £17.50 OUR PRICE £15.75 STARMON (machine code monitor) RRP. £22.50 OUR PRICE £20.25 T2P3 Tape to Disc RRP. £19.95 OUR PRICE £18.65 STARWORD 16K ROM RRP £34.50 OUR PRICE £31.75 SYARGRAPH GRAPHICS ROM R.R.P. £21.95 DUR PRICE £19.95 TP2CU (Tape to Cumana) R.R.P. £19.95 OUR PRICE 18.65

> PLUS 3 DISCS ACORNSOFT'S DATABASE RRP. £19.75 OUR PRICE £17.85 E.D.S. STEVE DAVIS SNOOKER RRP. £12.95 OUR PRICE £11.65 BIRDIE BARRAGE RRP. £12.95 OUR PRICE £11.65

FIRST BYTE JOYSTICK INTERFACE Includes conversion tape £18.94 + Quickshot II Joystick £12.98 TOTAL £32.94 OUR PRICE £27.99 FIRST BYTE INTERFACE ONLY RRP. £19.95 OUR PRICE £18.25

| | BBP | OUR | | R.R.P. | OUR | | RRP. | OUR | | R.R.P. | OUR PRICE |
|-----------------------------|----------------|-------|-----------------------------|--------|-------|------------------------------------|-------|-------|---------------------------------------|--------|--------------|
| | mar. | | but term | | 2.05 | KANSAS CITY | | | First Steps | 8.95 | 7.95 |
| AARDVAAK | 7.00 | 0.00 | Jack Atac | | 2.95 | Leany Loce | 6.95 | 4.95 | Here/There with Mr Men | 7.95 | 6.95 |
| Frak | 7.90 | 6.90 | Savage Pond BRITANNIA | | 2.90 | Ring of Time | 9.50 | 4.50 | Quick Thinking Plus | 6.95 | 5.95 |
| Zaloga | 7.90 | 6.90 | | 7.95 | 6.95 | Moon Buggy | 6.95 | 4.95 | Word Games | 9.95 | 8.95 |
| A.C. PRODUCTS | 24.60 | 22.20 | Play Your Cards Right | 7.00 | 0.00 | KOSMOS SOFTWARE | | | Mastermind | 9.95 | 8.95 |
| Advenced Disc Toolkit Rom | 34.50 | 32.20 | COMSOFT | | 2.05 | French Mistress A or B | 8.95 | 7.95 | Starseeker | 9.95 | 8.95 |
| ACORNSOFT | 10.00 | ***** | Serpents Lair | 4.95 | 3.95 | German Master A or 8 | 8.95 | 7.95 | Crackit Towers | 9.95 | 8.95 |
| Elite in Stock | 12.95 | 11.65 | Playbax | 4.95 | 3.95 | Spanish Tutor A or B | 8.95 | 7.95 | OASIS | | |
| Majic Mushrooms | 11,95 | 8.95 | S.A.S. Commando | 4.95 | 3.95 | Answer Back Jun. or Sen. | 9.95 | 8.95 | Aces High | 14.95 | 12.95 |
| Forth | 16.85 16.85 | 8.95 | C.D.S. | 0.05 | 7.65 | Answer Back Sport | 9.95 | 8.95 | ROBICO SOFTWARE | -12 | |
| Lisp | 29.99 | 17.95 | Steve Davis Snooker | 8.95 | 7.45 | Identify Europe | 7.95 | 6.95 | Rick Hanson | 9.95 | 8.95 |
| View Rom Cartridge | 29.99 | 17.95 | Birdie Barrage | 7.95 | 6.95 | LCL | | | Project Thesius | 9.95 | 8.45 |
| Viewsheet Rom Cartridge | 14.95 | 13.45 | C.R.L. | 7.05 | 0.00 | Micro French | 24.50 | 21.50 | SALAMANDER | | |
| Hopper ROM (Cart) | 14.95 | 13.45 | Test Match | 7.95 | 6.95 | Micro Maths (24 progs '0' Level) | 24.50 | 21.50 | 737 Flight Sim | 9.95 | 6.95 |
| Snapper ROM (Cart) | 59.80 | 54.80 | DR. SOFT | 2.00 | 0.05 | Micro English (24 progs 'O' Level) | 24.50 | 21.50 | SHARDS | | |
| ISO Pascal ROM Cart. | 99.00 | 24.00 | 747 Flight Sim. | 7.95 | 6.95 | Mega Maths ('A' Level) | 24.50 | 21.50 | Pettigrews Diary | 7.95 | 6.95 |
| ACORNSOFT/BES | 8.95 | 7.95 | Phanton Combet | 9.95 | 8.45 | LONGMAN'S SOFTWARE | | | Mystery of Java Star | 7.95 | 6.95 |
| Happy Letters | 8.95 | 7.95 | D.A.C.C. | 1 | | First Moves (Chess 8+) | 9.95 | 8.95 | Woodbury End | 9.95 | 8.95 |
| Timeman One | 8.95 | 7.95 | Flight Sim 747 (DACC) | 9.95 | 8.95 | MACSEN SOFT | | - | Whoopsy | 6.95 | 5.95 |
| Happy Numbers | 8.95 | 7.95 | Bebby Charlton Secon | 11.95 | 10.95 | Treasure Hunt | 9.95 | 8.45 | SHIELD | | |
| Wordhang | | 8.95 | DATABASE | | | Black Busters | 7.95 | 6.95 | Maths 'O' Lavel Examiner | 9.95 | 8.95 |
| Osprey | 9.95 | 0.30 | Mini Office | 5.95 | 4.95 | Gold Run | 9.95 | 8.95 | Physics 'O' Level Examiner | 9.95 | 8.95 |
| ACORN/LINKWORD | 14.95 | 8.95 | Micro Olympics | 5.95 | 4.95 | Bullseye | 9.95 | 7.95 | Chemistry 'O' Level Examiner | 9.95 | 8.95 |
| German | 14.95 | 8.95 | Majic Sword | 8.95 | 7.95 | MELBOURNE HOUSE | 1000 | | SOFTWARE INVASION | 200 | 201 |
| French | 14.95 | 8.95 | DURELL MARTECH | 202 | | Way of Exploding Fist | 9.95 | 8.95 | 3D Bomb Alley | 7.95 | 3.95 |
| Italian | | 8.95 | Geoff Capes | 8.95 | 7.95 | Classic Adventure | 6.95 | 5.95 | Gunsmoke | 7.95 | 3.95 |
| Spanish | 14.95 | 6.89 | Mineshaft | 8.95 | 5.95 | Hampstead House | 6.95 | 5.95 | Blitzkreig | 7.95 | 3.95 |
| ADDICTIVE GAMES | oor | 7.95 | Brian Jacks Superstars | 7.95 | 6.95 | Terromolinos | 8.95 | 5.95 | Super Pool | 7.95 | 3.95 |
| Football Manager | 8.95 9.95 | 7.95 | Combat Lynx | 8,95 | 7.95 | M.C. LOTHLORIEN | 812 | 7.77 | Votex | 7.95 | 3.95 |
| Boffin | 3.33 | 1.55 | Eddie Kidd Jump | 7.95 | 6.95 | Redcats | 6.95 | 5.95 | Chiphuster | 7.95 | 6.95 |
| ADVENTURE INT: | 7.95 | 5.95 | Gisburne's Castle | 7.95 | 8.95 | Paras | 6.95 | 5.95 | Stairway to Hell | 12.95 | 9.95 |
| Grentins | 7.95 | 5.95 | ENGLISH SOFTWARE | | | Johnny Reb | 6.95 | 5.95 | SLOGGER | 20000 | 2000 |
| The Hulk | | 4 | Jet Boot Jack | 7.95 | 4.95 | Special Operations | 6.95 | 5.95 | Dogfight (2 player joystick) Key opt. | 7.95 | 3.00 |
| Secret Mission | 7.95 | 5.95 | Kissin' Cousins | 4.95 | 4.25 | Waterloo | 9.95 | 8.95 | SQUIRRELSOFT | 2.00 | 2.00 |
| Mystery Funhouse | 7.95 | 6.95 | ELITE | | | Battlezone | 6.95 | 5.95 | Supergolf | 7.50 | 8.50 |
| Voodoo Castle | 7.95 | 5.95 | Commando | 9.95 | 8.45 | MICROBYTE | | | Trefalger | 8.00 | 7.00 |
| Pyramid of Doom | 7.95 | 5.95 | EPIC SOFTWARE | | | Er*Bert | 4.95 | 3.95 | SUPERIOR SOFTWARE | | |
| Pirate Adventure | 7.95 | 5.95 | The Wheel of Fortune | 8.95 | 7.45 | Reversi | 4.95 | 3.95 | Mr Wiz | 7.95 | 6.95 |
| ALLIGATA | 7.95 | 6.95 | Castle Frankenstein | 6.95 | 5.95 | Pinball | 4.95 | 3.95 | Smash and Grab | 7.95 | 6.95 |
| Blagga | 7.95 | 6.95 | The Quest of the Holy Grail | 6.95 | 5.95 | MICRODEAL | | | Overdrive | 7.95 | 6.50 |
| Bumper Bundle | 9.95 | 8.95 | Kingdom of Klein | 6.95 | 5.95 | Space Shuttle | 8.00 | 5.00 | Tempest | 9.95 | 7.95 |
| Contract Bridge Geardian | 7.95 | 6.95 | FIREBIRD | | | MICROPOWER | 2003 | 115 | Regton | 9.95 | 7.95 |
| Tarzan Boy | 7.95 | 6.95 | Star Drifter | 3.95 | 3.45 | Ghouls | 7.95 | 3.95 | Death Star | 9.95 | 7.95 |
| Nightworld | 7.95 | 6.95 | GILSOFT | | | Jet Power Jack | 6.95 | 3.95 | Repton 2 | 9.95 | 7.95 |
| ANCO | 1.00 | 0.23 | The Quill | 16.95 | 15.45 | Pasitron | 6.95 | 3.95 | Citadel | 9.95 | 7.95 |
| Thai Boxing | 5.95 | 4.95 | GOLEM LTD | 10.00 | | Swag | 6.95 | 3.95 | Karate Combat | 8.95 | 7.45 |
| ANIROG | 0.00 | 4.00 | Education I | 8.00 | 7.00 | Gauntlet | 6.95 | 3.95 | TYNESOFT | | |
| Jump Jet | 9.95 | 8.95 | Education III | 8.00 | 7.00 | Chess | 7.95 | 3.95 | Jet Set Willy | 7.95 | 6.50 |
| ATARISOFT | 0.00 | 0.00 | Fun with Words | 8.00 | 7.00 | Killer Gorilla | 7.95 | 3.95 | Tynesoft Starter Pack I | 9.95 | 8.95 |
| | 0.06 | E 0.6 | Fun with Numbers | 8.00 | 7.00 | Moonraider | 7.95 | 3.95 | lan Botham Test | 7.95 | 6.50 |
| Robotron | 9.95 | 5.95 | Jesaw | 8.00 | 7.00 | UXB | 7.95 | 3 95 | Rig Attack | 4.95 | 3.95 |
| ASK | 444 | | HEWSON | 277 | | Felix/Evil Weevils | 6.95 | 3.95 | Supergram (Adv) | 7.95 | 6.95 |
| Number Painter | 9.95 | 8.95 | Heathrow A.T.C. | 7.95 | 6.95 | Felix in Factory | 7.95 | 3.35 | Winter Games | 7.95 | 6.50 |
| Best 4 English | 19.95 | 18.45 | Southern Belle | 7.95 | 6.50 | Felix/Fruit Monsters | 7.95 | 3.95 | Mousetrap | 7.95 | 6.50 |
| Best 4 Maths | 19.95 | 18.45 | ASL SOFTWARE | | | Galactic Commander | 7.95 | 3.95 | Five-A-Side Socca | 4.95 | 3.95 |
| BLUE RIBBON | | | Bug Eyes II | 7.95 | 6.50 | Cybertron | 7.95 | 3.95 | Peg Leg | 4.95 | 3.95 |
| Nightmare Maze | | 1.99 | Frankenstein 2000 | 6.95 | 5.95 | Stock Car | 6.95 | 3.95 | Bouncing Bombs | 4.95 | 3.95 |
| Castle Assault | | 1.99 | | | | Which Salt | 8.95 | 3.95 | Wet Zone | 4.95 | 3.95 |
| Astro Plumber | | 1.99 | Caveman Capers | 7.95 | 6.50 | Rubble Trouble | 6.95 | 3.95 | U.S. GOLD | | 25.00 |
| Diamond Mine | | 1.99 | IMAGINE | | 1000 | Adventure | 7.95 | 3.95 | Beach Head | 8.95 | 5.95 |
| Diamond Mine II | | 1.99 | Yie Ar Kung Fu | 8.95 | 7.95 | MIRRORSOFT | - | | VISIONS/CSM | 0.00 | 0.00 |
| BUG BYTE | | 0.160 | INCENTIVE | | | Harrier Strike Force | 9.95 | 8.95 | Snooker Com | 8.95 | 7.95 |
| Twin Kingdom Valley | | 2.99 | Confuzion | 6.95 | 5.95 | Count with Oliver | 7.95 | 6.95 | 777 C A | 0.33 | 1.33 |
| | | 2.99 | INTERCEPTOR | | | Look Sharp | 7.95 | 6.95 | YES SOFTWARE | | |
| Starforce 7 | | 2.99 | Tales Arabian/Knights | 6.00 | 5.00 | Mr Men Storymaker | 9.95 | 8.45 | Galf | | 2.95 |

BOX OF 10 C20 COMPUTER CASSETTES £4.99 inc VAT & P&P.

ALL PRICES ARE INCLUSIVE OF VAT AND CARRIAGE

OVERSEAS ORDERS PLEASE ADD £1.00 THEN 50p FOR 2ND and 3RD ITEMS EACH We guarantee all titles are originals. We offer a quick and reliable service. Most Electron and BBC titles are available on request with the guarantee of at least £1.00 off the R.R.P.

| Please send me: | | Cost | Please make cheques payable to: 21st Software Ltd | Name |
|-----------------|---------|------|--|-----------|
| 1 | £ | | Send orders to: | Address |
| 2 | £ | | 21st SOFTWARE LTD | |
| 3 | £ | | 15 Bridgefield Avenue Wilmslow SK9 2JS | |
| 4. | £ | | Tel: Wilmslow (0625) 528885 | Post Code |
| | TOTAL £ | | Office Hours 9.30am-5.30pm (Mon-Fri) | Tel. No |



News

All that's new in the ever expanding world of the Electron.

Beginners

How modular methods can make writing your own programs easier.

10

Software Surgery

Our impartial appraisal of the latest software releases including Frankenstein 2000, The Quill, Thrust and many more. 13

HOWZAT!

Try not to get caught out in this vivid recreation of a day's test cricket.

View Driver

Ring the typographical changes in View with this invaluable printer driver.

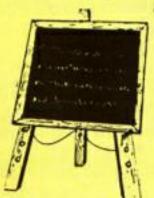
MicroLink News

A monthly update on the increasing potential of Britain's national on-line database. 26



Hardware

The DMP 2000 printer from Amstrad should have enough features for everyone - and the price is right.



Education

What do children benefit from learning Basic programming? We investigate.

3D Maze

After a night on the tiles you wake up trapped in a twisty maze, where a hangover's the least of your problems...

TextEd

Convert your computer into a versatile electronic typewriter with this powerful utility.



Formula 1

Cunning techniques to speed up your Electron by up to 230 per cent.

40





Merlin's Cave

adventurers from our resident wizard.

Features Editor

Mike Bibby

Deputy Features Editor

Production Editor

Peter Glover

Art Editor

Heather Sheldrick

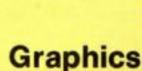
Reviews Editor

Chris Payne

Advertisement Manager

Micro Messages

The pages you write yourselves. Your ideas on the Electron scene make fascinating reading.



Discover the Electron's two very different ways of looking at the screen - one for text and one for graphics.

47

Bargains galore!

Don't miss our special offers on Pages 50 to 53.

More hints and tips for



Published by Database Publications Ltd Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

Telephone: 061-456 8835 (Editorial) 061-456 8383 (Administration) 061-456 8500 (Advertising) Subscriptions: 061-480 0171. Telecom Gold Mailbox: 72:MAG001. Prestel: 614568383. Telex: 265871 MONREF G. Quoting Ref. 72:MAG001.

ABC 24,788 July-December 1985

News trade distribution:

Diamond-Europress Sales and Distribution, Unit 1, Burgess Road, Ivyhouse Lane, Hastings, East Sussex TN35 4NR. Tel: 0424 430422.

Printed by Carlisle Web Offset.

Electron User is an independent publi-cation. Acorn Computers Ltd, manufacturers of the Electron, are not responsible for any of the articles in this issue or for any of the opinions expressed.

Electron User welcomes program listings and articles for publication. Material should be typed or computer-printed, and preferably double-spaced. Program listings should be accompanied by cassette tape or disc. Please enclose a stamped, self-addressed envelope, otherwise the return of material cannot be guaranteed. Contributions accepted for publication will be on an all-rights basis.

Subscription rates for 12 issues, post free:

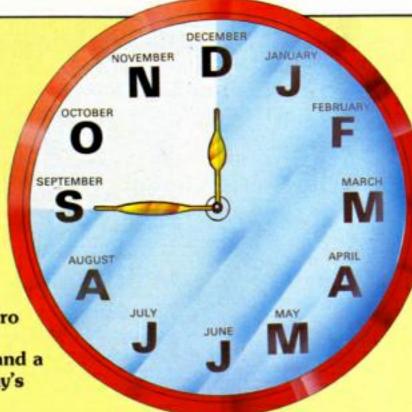
£12 UK & Eire (Sterling only) £35 Overseas

e 1986 Database Publications Ltd. No material may be reproduced in whole or in part without written permission. While every care is taken, the publishers cannot be held legally responsible for any errors in articles or listings.

Yes – it's bargainhunting time again!

For BBC Micro and Electron users this is the start of the top buying period of the year - the time when they stock up with all the latest hardware and software that will enhance the versatility, power and just sheer fun! - of their micros.

And the ideal time to hold the Electron & BBC Micro
User Show, where they get the best of both worlds – a
first look at all the fascinating new-season products, and a
chance to pick up really worthwhile bargains as yesterday's
top sellers are sold at rock-bottom prices!





EASY RAIL TRAVEL!

300 yards from Piccadilly railway station, with speedy connections from all parts of the North, Midlands and Wales.

EASY COACH TRAVEL!

Bus and coach stations serving all parts of this vast region are just a short walk from the UMIST campus.

EASY PARKING!

No problem finding somewhere to park either within the campus itself or nearby car parks.

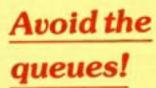
Renold Building, UMIST, Sackville Street, Manchester

10am-6pm Friday, September 26 10am-6pm Saturday, September 27 10am-4pm Sunday, September 28

- Listen to Acorn experts talking about all the exciting new developments coming from Cambridge!
- ★ Watch demonstrations from the BBC showing how to capture Ceefax pages and telesoftware on your BBC Micro.
- ★ See for yourself on the big screen the latest advances in music and graphics on the Electron and BBC Micro.



Regular sessions on each day of the Show!



Get your ticket in advance and...



| Under-16s tickets at £1 (save £1) £ | |
|---|-----|
| Total £ | . ! |
| Cheque enclosed made payable to Database Publications Ltd. | 1 |
| Please debit my credit card account | P |
| Access/Visa | |
| | |

Adult tickets at £2 (save £1) £

Admission at door:

£3 (adults), £2 (under 16s)

| THE SHOW | Advance ticket order |
|--|-----------------------------|
| Post to: Show Tickets Europa House, 68 Ch Hazel Grove, Stockpo | ester Road, |
| Name | |
| Address | |
| | igned |
| PHONE ORDERS: Ring S | how Hotline: 061-456 8835 |
| Please quote credit card number | and full address + Ref. MUR |

electron WEWS

£250 prize challenge for gamers

CHART-TOPPING game Thrust has been released for the Electron by Superior Software.

Part of the promotion is £250 in cash prizes – £200 for the winner – for the first to complete all 24 screens of the game.

Sales manager Ken Campbell said: "Never before have I experienced such excitement for an Electron game. We have had our fair share of chart hits but this one seems to beat the lot".

Managing director Richard Hanson, said: "The launch of Thrust marks the start of a series of major releases from the company".

The dual cassette costs £7.95.

A heart searcher

IN Imagine's new game for the Electron, Mikie, the player faces a load of heart searching.

The game is set in an American school with Mikie combating obstructions while searching for hearts hidden in various departments.

With each heart there is a letter, and when all are collected they form a sentence for him to open a secret door which eventually leads to his girl friend.

The cassette costs £8.95 and the disc £12.95.

BBC Micro power for the Electron?

A DRAMATIC increase in the overall performance of the Electron has been achieved as a result of two technological breakthroughs in the last six months.

So much so that independent experts are now claiming that the two add-ons combined make the machine "as compatible as possible" with the BBC Micro and the Master series.

Yet the cost of the complete package -

including the Electron itself – would still be less than £230.

Known as the AP4 and the AP5, both peripherals come from Advanced Computer Products, the Yorkshirebased development company.

First to be launched was the AP4, a disc interface which opened up the Electron to a vast pool of software previously restricted to the BBC Micro. It features 1770 DFS as

standard running with page at &EOO and costs £69.95.

Now ACP has informed Electron User that it is soon to unveil the AP5 which will effectively add three more interfaces to the machine.

It combines a 1 MHz bus, user port providing the same I/O as the BBC Micro and a Tube interface, and is likely to cost in the region of £60.

The user port will allow the Electron to control external devices such as robots, although special software will need to be written in each case.

ACP has already made AP5 capable of running the critically acclaimed AMX Mouse and its accompanying computer aided drawing package AMX Art.

The Tube interface will allow Acorn's second processor to be connected to the Electron for the first time.

This will provide a major boost in speed for the machine, in theory making it as fast as the BBC Micro.

60k extra

It will also create additional memory – some 40k of usable RAM in Basic and more than 60k for machine

"All this is part of our policy of reinforcing the Electron's position in the market", said John Huddlestone of ACP.

"And it seems to be working. Since we launched the AP4 we have in fact had to quadruple production.

"So there are obviously a lot of people out there wanting to make the most out of their machines".



TELEVISION star Fred Harris's love affair with the Electron continues. The former teacher who went on to become a household name in such programmes as Me and My Micro and Micro Live has recently bought his second Electron. "It's a very underrated and highly capable machine," he told Electron User.

ELECTRON TO STAR AT SEPTEMBER SHOW

A SURVEY among the first 20 exhibitors to book for the September Electron and **BBC Micro Show has** revealed they expect the Electron to be the main draw at the event.

Fifteen of the standholders reported that their overriding reason for attending was to capitalise on the booming Electron market.

One supplier, Advanced Computer Products, even pencilled in its booking a year ago to obtain a prime site at the show, which is being held at UMIST, Manchester, from September 26 to 28.

The swift reaction for bookings comes after the success of the Electron at the Spring show in London when 16,000 visitors, over three days, produced records sales of £1,200,000.

At the Spring show the first day alone saw more than 5,000 enthusiasts converge on the exhibition - the largest number ever during a weekday.

Database Exhibitions' head Derek Meakin said: "The continuing and increasing enthusiasm for the Electron is reflected by the keenness of the companies with their early bookings".

He added: "This is the only event in the North of England this year that will cater exclusively for the Electron and BBC Micro users. Judging by the advance bookings previous records will be broken".

At LCL Eve Ludinski revealed that the Manchester show will be the launching pad for LCL's new release for the Electron, Brain Teasers, an educational set of 24 programs catering for all

"The Spring show was such a success I was quick to book for Manchester. Our new educational software will cost £24, but there will be a £5 reduction at the show.

"I expect the

response to be just as fantastic as the last show", Eve added.

Nick Pearson of Advanced Memory Systems said: "We will have new products on show, including Mouse Mat, Mind Games, Zap Zone and Desktop".

One leading supplier to the Electron market said: "The last Spring show in London was such a success that I left my stand to go and book a spot for the Manchester event".

A spokesman for

Advanced Computer Products said: "We, like many others, will have special show prices.

"Even though it was a year ago when we asked for a stand at Manchester we already had plans for some exciting new products for the Electron. We wanted to be in early to ensure a good launch".

The survey showed there will be some 130 special show price offers, which by the time of the show should grow to more than 540.

THE boom in the Electron market continues, according to High Street giants Dixons.

Following their pre-Christmas coup of buying up almost all Acorn's available stock of Electrons - reputed to have been 100,000 sales are still going well.

Dixons' senior computer buyer Alan Dickinstores.

"There were of course substantial sales over the Christmas period, but it is still selling up to our expectations for the time of the year".

Business booms

son told Electron User: "Figures are confidential, but we can say the Electron is still selling well throughout all our

> Elect-A-Friend. "Now we can't go wrong. It's hearts and flowers all the way".

Match-

making

micros

AN Electron has been

brought in to play Cupid

in the Midlands with

some remarkable

used as the nerve centre

of a dating agency on

the outskirts of Birm-

ingham known as

monitor details of

people on the agency's

books in the hope of

achieving the perfect

Successful

Electron in question

been over the last 12

months that nine of the

couples it has intro-

duced are planning to

two years we were in

operation before we

introduced the com-

puter we only recorded

one engagement and

that was broken off",

said Joyce Jones of

"In the whole of the

So successful has the

It is called on to

Elect-A-Friend.

The machine is being

results.

match.

Irritates

The Electron considers details of age, height, weight, colouring, drinking and smoking habits, pastimes and even what irritates a person most about the opposite sex.

It then cross matches the data and makes the selection of the most likely mate.

To date the Electron has only one real failure on its hands - the young man who programmed the machine for the agency has still to find Miss Right.

"I think it's because he's better at handling computers than he is girls", observed Joyce. "But he hasn't given up hope yet".

Elite tops New courses link US charts micro with voice

ELITE, the best selling cult adventure for the Electron, has become the first UK game to make it to the top of the American charts - on the Apple.

It reached the number one slot on Billboard - the prestige USA list - after some aggressive marketing by Firebird Licensees.

Originally brought out under the Acornsoft label, it subsequently became the property of Firebird, the software arm of British Telecom.

"It is the first non-American game to make it to the number one spot", says a Firebird spokesman, "so naturally we are delighted".

AN enhanced version of its Micro English language program has been released by LCL for the Electron.

The course, which takes children aged eight through to O level standard, now includes an option for users to put their own words into the Speak-and-Spell section.

Any audio tape recorder can be used with the new version and back-up copies of the program tapes are now included free.

The course consists of 24 programs on three cassettes, or two discs and a voice tape, and costs £24.

Another release from LCL is Micro French which teaches users to read, understand and speak the language.

The course covers beginners through to O level GCE and GCSE and includes 24 programs with speech, animation and sophisticated multilevel help with errors.

On three discs and a voice tape, or three cassettes with manuals, Micro French costs £24.



SITUATIONS VACANT

COMPUTER WRITERS/EDITOR

Database Publications are expanding. And we're looking for more full time editorial staff.

The work will involve playing a major role in the running of one or more of our computer magazines.

Successful applicants will be working in all aspects of the editorial process, from the origination of articles to the final production of the magazines.

The people we're looking for will have experience in computing on one of the popular micros such as the BBC Micro or Amstrad. Equally important, successful candidates will have the ability to express their ideas clearly and fluently in writing.

However lack of direct experience in the fields of computing and publishing need not be a bar to applying. What we're looking for is drive, creativity and the ability to learn on the job.

If you have the qualities we require, send your full CV together with an example of your writing to:

> The Personnel Manager, Database Publications, 68 Chester Road, Hazel Grove, Stockport SK7 5NY

THE ELECTRON SECOND PROCESSOR



E2P-6502

PMS ADD SECOND PROCESSOR POWER TO THE ELK!

Disappointed by the speed of your Electron?

Would you like an ELK that performs like a Beeb?

Is shortage of RAM getting you down?

Unable to use 80 column display with View?

IF YOUR ANSWER IS YES —

THEN PMS HAVE THE SOLUTION

LOOK AT THIS INCREDIBLE SPECIFICATION:

- 300% speed increase in Basic (Mode 0)
- 3.5 times more text in View (Mode 3)
- 30K Basic programs in all modes
- 60K free for machine code
- 'HI' Languages (Basic & View) give 45K
- Absolutely no modifications required
- Plugs into Plus 1 slot
- Runs BBC ROM Languages (Comal, Viewstore etc)

ALL THIS FOR

ONLY £89 INC VAT + £2 DELIVERY

THE ULTIMATE "ADD-ON" FOR THE ELECTRON

WHY ADD A SECOND PROCESSOR?

It has long been realised, by companies such as Acorn, that the best way to increase the power of a computer is to add a Second Processor. BBC users have had this facility for some time, and now PMS can add Second Processor Power to the Electron. The E2P has a full 64K of RAM on board, and a 6502A running at 2MHz. With the E2P installed the Electron becomes an I/O processor, thus freeing the Second Processor from the time consuming, and memory grabbing I/O tasks - controlling disk, keyboard, screen updating etc. The current language, (BASIC, VIEW etc) runs in the E2P, only interrupted from this task when communication

with the I/O processor is required. The E2P Operating System, which controls the Second Processor, fully implements the Acorn TUBE protocols. Software written obeying these protocols will run in the E2P. The default language in the Electron is automatically copied into the E2P on a CTR-BREAK and certain other languages (eg HIBASIC) can be directly *LOADed into the E2P. The Electron version of HIBASIC, which gives 45K free, can be obtained from PMS. The E2P will work in conjunction with the Slogger Turbo, and makes the Electron/E2P even faster!! The E2P is compatible with the PLUS 3 and Cumana disk interfaces.

FOR MORE DETAILS CONTACT OUR SALES OFFICE

E2P-6502 SECOND PROCESSOR ORDER FORM

| EE, OCCEPTOR | | |
|--------------------------------------|------------------------------|----|
| Please send me_ at £89.00 + £2 P& | E2P-6502 Second Processor(s) | 67 |
| I enclose cheque/pos | tal orders for a total of £ | |
| OR | | |
| Please debit my ACC | ESS account by £ | |
| A/c No | Expiry date | |
| NAME | SIGNED | |
| ADDRESS | | |
| | POSTCODE | |

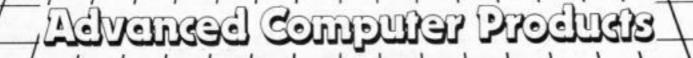
E2P Operating System required on: 5.25in disk/3.5in disk/tape/ROM (delete as required) CHEQUES SHOULD BE MADE PAYABLE TO 'PERMANENT MEMORY SYSTEMS'

Send to: Permanent Memory Systems, 38 Mount Cameron Drive, St Leonards, EAST KILBRIDE G74 2ES Please allow 28 days for delivery



PHONE 03552 32796





THE ADVANCED PLUS FOUR

"Disc drive compatibility at long last".

ELECTRON USER, JUNE '86

The Advanced Plus Four (A.P.4.)

- A FULLY ACORN COMPATIBLE disc I/face for the 'ELK' & Plus 1
- Accepts any standard 5½" or 3½" disc drive with PSU
- Supplied with 1770 DFS (as supplied on the B+ & Master series)
 (A.E.D. is still available for Plus 3 users @ £24.15 inc.)
- Page stays @ &EOO, the same as Tape F.S. NO LOSS of RAM
- Will allow more tape software to be run from disc
- Access compatible BBC disc-based software. No conversion program needed
- Extra sideways ROM socket fitted as standard (will take ADFS when available)
- A self-contained, well finished and fully tested product
- No 'short cuts' in design, finish or components
- ROM s/ware includes format, verify, free space and utils.
- Achieve greater BBC compatibility £69.55 (+VAT)

"I can recommend it to anyone contemplating upgrading to disc". Electron User, June '86
"The AP4 should be considered the standard interface for the Electron". Acorn User, July '86

AP4 SPECIAL PACKAGE PRICES

The Advanced Rom Manager

A friendly utility for ROM and sideways RAM users.

FEATURES:

- Compatible with Master series, BBC, B+ and Electron
- Bi-directional Hex/Ascii/65C02 disassembler ROM editor
- Turn off ROMs
- Make files suitable for ROMs

A.R.M commands allow you to:

- Load and run programs from sideways RAM
- Offer commands to specific ROMs
- Creates files suitable for the ROM filing system
- ROM and sideways RAM memory editor
- Loads ROM program into sideways RAM
- Moves memory to/from sideways RAM/ROM
- Saves ROMs onto disc/tape
- Generates a ROMs checksum and CRC
- Disables unwanted ROMs permanently
- Start execution of a machine code programming in ROM

Special limited offer price of only

£9.99 incl.

Order details and other products see our main ad on opposite page.

A.C.P. 6 Ava House, High Street, Chobham, Surrey GU24 8L2.

Tel: (0276) 76545

16k EPROM Advanced Disc Toolhit containing over 30 commands

Advanced Computer Products 6 Ava House, High Street, Chobham, Surrey GU24 8LZ

(0276) 76545

AP4 Packages + D/Drive AP4 100 **AP4 400**

ADVANCED DISC TOOLKIT (01)/M/8/E

Any Acorn user including Master, BBC B+, Electron, DFS, 1770 DFS, ADFS, 2nd. & coprocessors A.C.P.'s BEST SELLING product containing over 30 commands inc.:- powerful memory & disc editor, search memory/disc/ basic, catalogue/unplug ROMS, load/run programs below page, automatic menu, file transfer (inc. locked cassette files), ADFS utils etc. etc. ("it's superb" ... Database Pubs. -'excellent value for money" ... Acorn User) (16K EPROM & FULL MANUAL)

ADVANCED ROM ADAPTOR 2 (03) /M/E+1/

An Acorn approved cartridge containing a card with special 'zero' profile sockets that allow you to fit compatible 8K or 16K EPROMS/ROMS. The cartridge is fully enclosed providing complete protection for your ROMS. Simple to use -no switchingcomplies fully to the Acorn (sideways) Rom Filing System. A.R.A.2 contains 2 sockets.... A single adaptor is also available.... A.R.A.1 (02) /E/£10.35

ADVANCED SIDEWAYS RAM

(04) /E+1/ A highly versatile but simple to use s/w RAM cartridge that is automatically write protected on loading. Contains 16K RAM but can be switched (externally) to 2 X 8K RAM. Supplied with instructions & full software support (on cassette) to save ROM images to disc/tape, load RAM from file, Advanced Print Buffer & MakeRom a utility to merge several files from

disc to be run from the ROM FS. (S/Ware on disc : please add -£1 51/4 DFS .. £2 31/2 ADFS)

ADVANCED ELECTRON DFS

(05) /E/ Electron & Plus 3 users ... gain BBC compatibility by adding the Advanced Electron DFS (1770 DFS) this is the same disc filing system supplied with the BBC B+. Now you can produce and access (compatible) BBC disc based software. A.C.P. also supplies 51/4" disc drives to add to your Plus 3 (inc. 2nd. drive adaptor). "ACP has produced another superb ROM for the Electron".. Electron User

Feb '86 (supplied on 16K EPROM + DFS MANUAL)

ADVANCED DISC INVESTIGATOR (06) /M/B/E/

A very powerful Disc utility for standard & non-standard discs. Backup most protected discs, edit any type of non-standard disc, check & repair faulty tracks, create new disc formats, copy 40track discs to 80track discs, verify two non-standard discs.

("ADI features an extremely comprehensive sector editor, and one of the finest I've seen' Tublink on Prestel)

(supplied on 16K EPROM + manual)

ADVANCED ROM MANAGER

* £9.99 * (07) /M/B/E/

A friendly utility for ROM & sideways RAM. Examine ROM/RAMs, load files into RAM, move memory to/from SWays ROM/RAM, catalogue/kill ROMS, offer commands to specific ROMS, save ROMs to disc/tape, AUTOROM a file (inc. BASIC) to run from SWays ROM/RAM, execute specific machine code subroutine in a ROM, generate a ROM's checksum & CRC.

SPECIAL ANNIVERSARY PRICE .. LIMITED PERIOD* (supplied on EPROM + manual)

ADVANCED PLUS 4

(08) /E+1/

£79.98

£34 50

'Disc drive compatibility at long last" Electron User June '86. "The AP4 should be considered the standard interface for the ... Acorn User July '86. This sums Electron up AP4 & ACP's approach to producing products. AP4 is a fully ACORN compatible disc I/face & will accept any standard drive inc. PSU, runs 1770 DFS (as fitted in the B+ & Master), keeps page & EOO, utils in ROM & provides a spare rom socket. "ACP's Plus 4 comes out on top. I can recommend it to . Electron User, June '86. anyone . AP4 packages + D/Drive, AP4 100/AP4 400

ADVANCED PLUS 5 (09) /E+1/ NEARING COMPLETION

A triple interface cartridge providing...

- a TUBE i/face allowing a second processor to be connected, increasing BOTH speed & memory (PAGE &8øø HIMEM &8øøø in all
- 2) a 1 MHz BUS for control applications &
- 3) the USER PORT for mouse and graphic devices

Also contains 2/3 ROM sockets and on board operating software for 2nd processor.

ADVANCED 1770 DFS 3 versions ADM (11) - ADB (12)

ADE (13)

ACP have totally re-written the Acorn 1770 DFS, enhancing existing features & adding new ones. The result is probably the fastest & most powerful disc filing system your computer could have. With the ability to operate in double density occupying both sides of a disc (640K). Automatic file relocation, improved file handling, 62 file catalogue and Sways RAM can be used as a fast RAM DISC

(16K EPROM + comprehensive manual)

ADVANCED ELECTRON DFS Egg

An alternative to our AED(05) for Plus 3 and ASR users. This optional alternative DFS is designed for use in Sideways RAM (ASR) and allows the user to operate a disc filing system

&Eee when using the Plus 3 (in ADFS page would normally be &1Dee). The DFS is simply loaded using the software supplied with the ASR from disc. (optional upgrade for existing AED users £9.50 on return of original EPROM)

(3 1/2" ADFS disc + manual)

OTHER PRODUCTS & SPECIAL OFFERS

| VIEW cartridge | (101) | /E+1/ | £15.00 | 31/2" discs in 1/box(120) /M/B/E/ £24.0 | 00 |
|------------------|-------|-------|---------|---|----|
| Vsheet " | (102) | /E+1/ | £15.00 | 51/4" discs ds/dd "(121) /M/B/E/ £12.5 | 99 |
| VIEW & VSHEET | (119) | /E+1/ | £25.00 | 51/4" discs ss/sd (122) /M/B/E/ £ 8.9 | 9 |
| LISP cartridge | (103) | /E+1/ | £ 9.99 | 31/2" disc drives (please call for price) | |
| E/Adv User Guide | (104) | /E/ | £ 4.95 | 51/4" disc drives (please call for price) | |
| TURTLEgrhpCASS | (105) | /E/ | £ 3.99 | 2nd. Drive Adaptor(130) /E+3/ £ 7.9 | 5 |
| LOGO cartridge | (106) | /E/ | £44.95 | 31/4" library box10 (124) £ 2.9 | 5 |
| PASCAL cartridge | (107) | /E/ | £44.95 | 16K EPROMS (131) £ 3.7 | 5 |
| VIEW pack BBC | (118) | /8/ | £49.00 | VIEWSTORE (117) /M/B/(e) £57.5 | |
| AP4 100 | (140) | /E+1/ | £199.00 | | |
| AP4 400 | (141) | /E+1/ | £299.00 | | |

(PRODUCT No) PRODUCT QTY

Equipment codes /M/ = Master /B/ = BBC /E/ = Electron /E+1/ = Electron + Plus 1

Please send order to Advanced Computer Products Ltd. 6 Ava House, High Street, CHOBHAM, Surrey, England GU24 BLZ Tel 0276 76545 (mail order only)

NAME



(in event of any query



POSTCODE

please include your tel. no.)

CREDIT CARD No. EXPIRY DATE (Ref E15)

I enclose payment for £

TOTAL

DO you remember dealing with subroutines – sections of programs that can be used over and over again from the main program?

This is done courtesy of the keywords GOSUB, which sends the program to a subroutine, and RETURN, which sends control back to the main program.

We even saw how one subroutine can call another.

This month the subject is once again subroutines, as you'll see if you take a look at Program I.

In this case the program is more subroutine than anything else. Line 30 calls the sub-

```
18 REM Program I
28 silly = 188
38 GOSUB silly
48 END
188 REM a sily subroutine
118 PRINT "This is a sill
y subroutine"
128 GOSUB silly
138 RETURN
```

Program I

routine and, as it so rightly says, it is a very silly one indeed.

All it does is print the message and then GOSUB 100s again. In other words the subroutine is called again from within itself. While we might find this mind-boggling the Electron takes it in its stride.

The program goes to line 100 as instructed and starts again from there. Line 100 prints the message and the next line calls the subroutine once more.

This happens over and over again. Notice that the program never meets the RETURN of line 130, as the previous line always sends the program off round the subroutine again. The result of all this is that a series of:

This is a silly message

message appear. And then things grind to a halt with a:

Too many GOSUBs at line 128

The program has disappeared up its own subroutine. What's happened is that the

Using your stubs makes good sense

PETE BIBBY takes another look at the intricate delights of subroutine calls

micro has exceeded the number of subroutine calls the Electron can handle.

As we learnt last time, after each GOSUB the computer makes a note of the next line number so that it can find its way back after it meets a RETURN.

But, as we've seen, in this case the program never meets a RETURN. There's only so much memory available to keep track of the return addresses and when this is eventually used up the program crashes.

However don't let this put you off having subroutines call themselves – it can be a very powerful technique, so long as you stop the process before the memory gets full. Program II show the technique.

The program uses the numeric variable count to keep track of the number of times that the subroutine calls itself.

So long as count is less than 10 the IF of line 130 allows the routine to call itself. In effect it behaves like the previous program.

The crunch comes when count is equal to 10. Now the part after the IF is ignored, so the GOSUB isn't obeyed. The program goes on to the next line and finds a RETURN.

This tells it to go back to the line following the GOSUB that called that subroutine. Well the line that called it was line 130, so the line after it is line 140. And this is a RETURN, so the whole process begins again.

This happens nine times in all as the program keeps hitting the RETURN of line 140 and the subroutines unwind.

Finally the last RETURN send the program not to line 140, but to line 50, which is the one after the original subroutine call. As this is an END the program stops.

Don't worry if you find that a little difficult. It's one of those concepts that takes time to sink in. It's worth the mental effort though for it allows us to use a powerful programming technique known as recursion.

If you feel like you want to know more about that have a look at Notebook in the April 1986 Electron User but not before you've thrilled to the unique delights of Program III.

Take a close look at the subroutine defined between lines 100 and 150. Can you see anything unusual? If you can't, try counting the number of RETURNs. There are two instead of our usual one. Let's see how it works.

The first lines of the program just ask your age and store it in age. Then the subroutine is called and the program goes to line 100.

Ignoring the REM it moves on to the next lines, displays the message and moves onto line 130. What happens now depends on the value of age.

If age is less than 18 the

condition is true and the instruction after the IF of line 130 is obeyed.

Since this is a RETURN it means that if age is less than 18 the subroutine ends at that point. However should age be 18 or over the condition is false and line 130 is effectively ignored.

In this case the program goes on to lines 140 and 150, printing a second message for those over 18 who can legally buy a pint. The RETURN of line 160 ends the routine.

So that's how you can have more than one RETURN in a subroutine. In fact you could have a whole battery of them, tucked away behind IF statements.

However no matter how many you have the first condition that's true brings into play the RETURN that ends the subroutine. Try adding further messages to the subroutine in Program III,

18 REM Program II
28 silly = 100
38 count=0
48 60SUB silly
50 END
180 REM a sily subroutine
110 PRINT "This is a sill
y subroutine"
120 count=count+1
130 IF count<10 THEN 80SU
B silly
140 RETURN

Program II

```
18 REM Program III
   28 messages=188
   38 PRINT "How old are yo
u";
   48 INPUT age
   58 80SUB messages
   68 END
  100 REM messages
  118 PRINT
  128 PRINT "No matter what
 your age, if you can read,
 you can read this magazine
  138 IF age(18 THEN RETURN
  148 PRINT
  150 PRINT "Why not read i
t in the pub with a pint?"
  168 RETURN
```

Program III

aimed at the over 40s and over 60s.

As a word of warning never use a GOTO to jump out of a subroutine, as madness lies that way. Always use RETURN.

That's where we'll leave the mechanisms of subroutines and go on to see how they can help us create programs that work.

To do this let's suppose that we want to write a very simple program that just takes two numbers, multiplies them and gives the result. Almost immediately you should be able to see that the program divides naturally into three areas:

get the numbers do the calculation display the results

and each of these tasks could be handled by a separate subroutine, such as:

BOSUB get the numbers BOSUB do the calculation BOSUB display the results

This leads naturally to something like Program IV.

It's fairly obvious what's happening. The lines from 10

18 REM Program IV 28 SOSUB 188: REM get the 38 SOSUB 200: REM do the calculations 48 BOSUB 308: REM display the result 99 END 188 REM get the numbers 118 PRINT "get the number 199 RETURN 200 REM do the calculatio ns 218 PRINT "do the calcula tions" 299 RETURN 388 REM display the resul t 318 PRINT display the res ult* 399 RETURN

Program IV

to 99 form the main part of the program, containing our three subroutine calls.

The subroutines themselves are to be found in lines 100 to 199, 200 to 299, and 300 to 399. Notice how I've arranged that the subroutines start on a "hundreds" line number and end with a RETURN on a "ninety nine" number. Also notice that at present they do nothing but display what they are supposed to do.

Be that as it may, Program IV is one that works. Not only have we constructed it logically using subroutines, but we can also run it and check that it is performing as we expected and that the subroutines occur in the right order.

In this example it's easy enough to see what will happen without bothering to run the program, but imagine what it would be like if the subroutines called other subroutines, or even themselves.

This use of dummy subroutines – or stubs, as they are

18 REM Program V 28 BOSUB 188: REM get the numbers 38 80SUB 288: REM do the calculations 48 GOSUB 388: REM display the result 99 END 188 REM get the numbers 118 PRINT "Sive se the fi rst number" 120 INPUT first 138 PRINT "Bive as the se cond number* 148 INPUT second 199 RETURN 200 REM do the calculatio 218 PRINT "do the calcula tions" 299 RETURN 300 REM display the resul 318 PRINT display the res ult" 399 RETURN

Program V

known - comes in handy for keeping track of a program's logic and checking that it makes sense before spending a lot of time on the actual coding.

Once we've got a listing in the form of Program IV we can go on to make our programming life simpler by practising the age old technique of divide and conquer.

Obviously we need to put some proper working code into the subroutines to replace the messages, but rather than attempt to write all the subroutines at once let's take one at a time.

This not only makes the task less daunting, it also allows us to test each stage separately.

After all if we code all three subroutines at one time and then find that there's a mistake in the program the mistake could be in any of the subroutines.

If we only code one routine at a time and then test run the program if there's a mistake it must be something to do with that routine. The error becomes easier to track down and correct. Program V shows the results of this approach.

Here line 110 to 140 have replaced the previous stub. The result is that the subroutine now collects two numbers and stores them in first and second. This part of the program can now be tested and seen to work. If necessary temporary lines such as:

145 PRINT first, second

can be added to make it clearer what's happening. As a rule I always number these test lines with a line number ending with 5. This makes them easier to spot and delete in the final tried-and-tested listing.

Once we're sure that the first subroutine has done its job we can continue in the same fashion. One by one we code the following subroutines, testing each one as they are written. In the end we'll have a program such as Program VI.

This does the task asked

18 REM Program VI 28 BOSUB 188: REM get the numbers 38 BOSUB 200: REM do the calculations 48 SOSUB 388: REM display the result 99 END 100 REM get the numbers 110 PRINT "Bive me the fi rst number" 128 INPUT first 138 PRINT "Sive me the se cond number" 148 INPUT second 199 RETURN 200 REM do the calculatio ns 218 result=first*second 299 RETURN 300 REM display the resul 318 PRINT first " times " ;second" is ";result 399 RETURN

Program VI

and, from the fairly logical task by task way it was created, we can be fairly confident that it will work. Also in this modular form, as it's known, the program is easy to change.

Suppose that now we had to take the two numbers and multiply the first by 10, the second by 12 and subtract one from the other.

All we'd have to do would be to change the expression in the second subroutine and the message in the third. The rest of the program would remain unaltered.

It's the same if we decided that first and second could only take values between 1 and 10. All we have to do is slot in another subroutine as Program VII shows.

Now the program has a new subroutine call at line 150. This calls the subroutine defined following lines 400 which just uses a compound condition to check that both numbers are in range. If they're not they have to be

Beginners

From Page 11

re-entered.

numbers

calculations

the result

99 END

rst number"

cond number"

128 INPUT first

148 INPUT second

I think you'll agree that this modular method of writing programs makes things easier. Taking things one at a time

18 REM Program VII

28 GOSUB 188: REM get the

30 BOSUB 200: REM do the

48 GOSUB 388: REM display

188 REM get the numbers

118 PRINT "Give me the fi

138 PRINT "Sive se the se

allows even the most modestly gifted programmer to write quite complex routines with a minimum of errors.

If you find a better way of doing things later you can go

200 REM do the calculatio

218 result=first*second

300 REM display the resul

318 PRINT first " times "

400 REM check the range

8 OR second(8 OR second)18

418 IF first(8 OR first)1

;second" is ";result

he range

ns

199 RETURN

299 RETURN

399 RETURN

THEN BOSUB 100

428 RETURN

back to the appropriate subroutine and modify it.

We'll finish this month with an example of how stubs can help to find program errors. Have a look at Program VIII.

This seems to be a program that simply decides whether or not you can vote, but in practice there might be all sorts of information in the subroutines - when you'll be elegible to vote, where you can vote and so on.

Yet it has a fault. Try entering test values into the program and see what happens.

The problem lies in the fact that when you have age equal to 18, neither subroutine is called. That value of age drops through the conditions. Obviously the condition in line 50 should be >= rather than >.

So as you can see stubs not only help you write programs more easily, but with the right test data they can also spot mistakes before you waste a

18 REM Program VIII 28 PRINT "What's your ag .?" 38 INPUT age 48 IF age(18 THEN GOSUB 188: REM Too young 58 IF age>18 THEN GOSUB 200: REM Can vote 68 END 188 REM Too young 118 PRINT age " is too yo 199 RETURN 200 REM Can vote 218 PRINT age " can vote" 299 RETURN

Program VIII

lot of time and trouble coding.

That's where we'll finish for

now. Try the divide and

conquer method of program-

ming for yourself - you'll soon

see how it helps your pro-

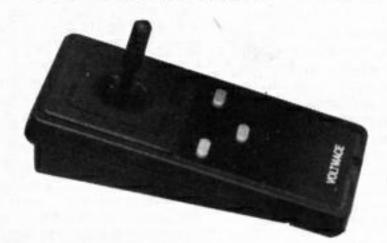
grams improve. Next month

we'll look at procedures.

150 BOSUB 400: REM check t

Program VII

JOYSTICKS— THE COMPLETE SOLUTION



DELTA 3B SINGLE—BBC B or ELECTRON PLUS 1 £12.00

A single joystick that in some ways can act as two. The custom made special "low noise" potentiometers are wired so that it will work as a left hand or right hand joystick. It can even run some programs written for two joysticks and has the fire buttons of both.

DELTA 3B TWIN-BBC B or ELECTRON PLUS 1

A direct but improved alternative for the original ACORN joysticks, with 2 joysticks wired to one plug. As with all our joysticks they have the fast action sprung to centre return of the steel shafted nylon covered joystick. The light action makes them ideal to hold and the 3 fire buttons allow left or right-handed use.



Available from your dealer or direct from us





mace Limite

Park Drive Baldock Herts SG7 6EW Telephone (0462) 894410

Can you apply the brakes?

Program: Loony Loco

Price: £4.95

Supplier: Kansas City Systems, Unit 3, Sutton Springs Wood, Chesterfield S44 5XF. Tel: 0246 850357

IN Loony Loco the evil baron will stop at nothing to destroy the train. You play the part of the hero who must outwit the enemy and apply the brakes.

That little story is used by Kansas to link together four activities, all with a railway flavour.

In the first activity you drive an engine along a track with the scenery scrolling past in the background. To make life difficult for you airships and planes keep flying over and dropping bombs.

A well directed puff of smoke is required to prevent these from causing a disaster.

Also causing problems are runaway trucks. These can be avoided by firing a harpoon at them or by switching tracks at the numerous points along the way.

When you reach your destination you

progress to the next part of the game. In this you are running along on top of the carriages.

Not only do you have to leap smartly from coach to coach, but you must also jump over the balls which are rolling along, and duck under the arrows that are fired at you.

Your aim is to reach the buffet car to gain access to screen three.

Once in the buffet car you must catch the cups and saucers that are rolling along conveyors.

The kindly railway management will allow you to drop a maximum of three while trying to catch the required 40.

Screen four is quite different from the others in that it is a logic problem, requiring you to set the eight switches to put the train's brakes on.

The trouble is you can only move switch eight if the other seven are correctly set and so on.

You are allowed 300 moves, and at first you'll need them. I think the lowest possible number of moves is 170.

Loony Loco is the best program I have



seen from Kansas City Systems. Screens one and two are fast and furious arcade action with good smooth graphics and useful sound effects.

Screen three is the weakest because the cups come in a soon predictable set pattern. The fourth screen is great fun to crack, but once learned it is no problem.

You can start the game on the screen of your choice. Overall it is a first-rate package and highly recommended.

Rog Frost

| Sound | 6 |
|-----------------|----|
| Graphics | 8 |
| Playability | 8 |
| Value for money | 10 |
| Overall | 8 |

Creating adventures made easy

Program: The Quill Price: £16.95

Supplier: Gilsoft, 2 Park Crescent, Barry, South Glamorgan CF6 8HD. Tel: 0446 732765

GILSOFT are modest enough to call The Quill an adventure writer's utility. I would go a lot further than that. If you can't program in machine code then the Quill is an absolute must!

Although an adventure creator it produces machine code games. It consists of two parts - a database editor and an interpreter.

The main menu controls access to all the utilities you need, such as saving, testing and loading your creation.

Sub-menus cover printing, amending and inserting all the text, movement and status values for your adventure.

Your adventure is created using the tables which are available from the main menu.

Text is selected from the main menu, then from the sub-menu you can either insert new text with or without specifying a location, or amend text already entered.

After entering your text you are returned to the sub-menu and can then view it or get a printout.

Aside from text you also need to insert the data relating to the events that take place during the course of the game and this is done via three further tables -

movement, event and status.

The movement table is used to set the directions for each location and the room that each move will take the player to.

The event table specifies the actions the interpreter has to take to reply to a player's command, such as deciding whether an object can be dropped before allowing a player to DROP it.

The status table contains the entries handled by the interpreter that are independent of player input, such as keeping track of the player's inventory as he moves from location to location.

It is possible to assign synonyms by giving them the same word value. A random function of especial interest to Dungeons and Dragons fans, is incorporated by the implementation of a CHANCE command.

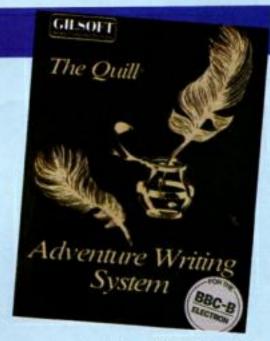
It is also possible to use up to 64 flags for situations that can occur during playing of the game.

They are simply variables that control situations and objects, such as whether or not a room is lit or how many objects a player is carrying.

The Quill allows a maximum of 253 locations and about the same number of objects and messages, so it is possible to create a lengthy adventure.

However if you go for large amounts of text you will find that memory limitations will affect the size of your adventure.

It is possible to save your creation in two ways, either as a database - in which



case you can load it back in and test it at a future time, or as a completed adventure in which case the interpreter is saved as well.

When saved as a completed adventure it will run independently of The Quill and Gilsoft have no objection to you marketing it provided you credit them with having used The Quill to produce it.

It is an absolute godsend to people who have the imagination, but not the programming ability, to create adventures. I simply cannot recommend it highly enough.

Paul Gardener

| Documentation | 3 |
|--------------------|---|
| Documentation | , |
| Value for money 10 | , |
| Overall | • |

Getting into Frankenstein's mind

Program: Frankenstein 2000

Price: £6.95

Supplier: Audiogenic, 12 Chiltern Enterprise Centre, Station Road, Theale, Berks. RG7 4AA. Tel: 0734 303663

IN Frankenstein 2000 your aim is to revive the famous old monster which you have found on inheriting the infamous baron's castle.

In the futuristic world of 2000 AD your method is to shrink yourself down to a tiny size and enter the monster's body.

Stage one finds you in the monsters throat which is full of frogs. Your task is to destroy as many of these as possible during your journey downwards.

This is best described as a version of Space Invaders. As you travel you will sustain damage from colliding with frogs or the throat walls.

You will also use up oxygen. Too much of the first or too little of the second spells the end of your mission.

Before reaching the lungs a pellet of

oxygen must be shot. If you take a long time to hit it you won't have much oxygen for the next stage.

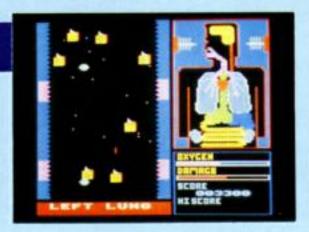
The activity in the lungs is very similar to the frogs in the throat, but here it is cigarette packets you must shoot. An added hindrance is bubbles of carbon dioxide which float up towards you.

After shooting another oxygen pellet you reach the heart where you steer through the various cavities to activate the implant.

It requires careful timing to get past the electrical impulses and to slip through the valves as they open.

A rather unpleasant task faces you in the stomach. You have to shoot the slices of greasy bacon, while avoiding the fried eggs.

Finally you reach the brain where, if you've got the oxygen supplies and a minimum of damage, you can knock out the bad neurons. This requires real precision, and I have not yet managed to do it. Audiogenic has an original idea with



this game, but it doesn't quite succeed.

Technically it's all fine with neat, fast graphics and it has pleasing sound effects.

However the whole program lacks any kind of extra feature to make it stand out from the crowd.

Rog Frost

| SoundGraphics | |
|-----------------|---|
| Playability | 5 |
| Value for money | |
| Overall | 5 |

Cracking fun at the towers

Program: Crack It! Towers

Price: £8.95

Supplier: Mirrorsoft, Maxwell House, 74 Worship Street, London EC2A 2EN. Tel: 01-377 4600

ACK Iti Tawara dasaribas ite

CRACK It! Towers describes itself as a puzzle game for all ages. Mirrorsoft have done well to think of some kind of explanation because it's far easier to say what the program is not.

It certainly is not an arcade game or an adventure. It has educational elements, but it isn't a learning program.

What is it then? It's a whole load of fun for Electron and BBC Micro owners.

The aim is simply to find the secret of Count Crack It! You must collect seven golden keys which you'll need to open the eighth room in his castle.

To gain the seven keys you must visit various rooms and solve a set of puzzles and problems in each.

In room 1 in the castle you try to discover what Oswald eats for lunch. This can best be described as a hangman type game.

Success will earn you a key while failure will pitch you into the moat. If you end up in the moat the piranha will start swimming towards you.

A question such as 184 divided by 4 will flash on the screen. A correct answer will stop the fish and you will survive to visit more rooms.

Room 2 features a logic game in which you must shoot some beasties while

trying to avoid shooting yourself. It's a version of the ancient game of Nim and it's easy to make mistakes.

Room 3 looks a bit like space invaders, but with bats bombing you. Before you can fire back you need to match a subtraction sum with its correct answer.

This room is fiendish, requiring you to concentrate on three different areas of the screen, do a calculation and keep your base away from the bombs.

The castle swimming pool can be found in room 4. It will come as no surprise to learn that the Evil Count Crack It! keeps sharks in it.

To avoid them you will have to add a number to a sequence such as 5, 10, 15, 20 and so on.

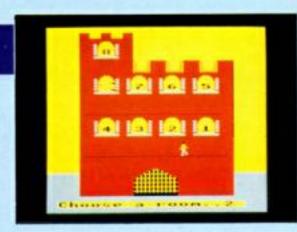
Room 5 is the spiders' playroom. You have to move your stick of dynamite around to make a spider fall on it, but before any spider falls you must get a multiplication sum correct.

On to room 6 where Albert the Alien lives – in a minefield. In a limited time you must issue commands such as "west 3" to steer him to safety.

Room 7 features ghosts who won't destroy you if you are quick enough at solving an anagram.

You can enter the rooms in any order, but they all need unlocking by adding a set of numbers together.

If you succeed in any room you can try for a bonus key by entering the maze of 17 skulls. If you pick on the right skull, aided by a devious clue, you win. The



Count keeps many more nasty friends who leap out at unexpected moments and steal precious keys or put you into prison.

Some of these can be stopped by hitting Space, but others require you to complete words or solve number problems very quickly.

If you get fed up with the words defined in the program you can enter your own selection.

My whole family have found this an addictive program. None of the tasks are difficult in themselves, but to succeed you will need fast reflexes and an alert brain.

Mirrorsoft has come up with something quite out of the ordinary and for my money, it's a real winner.

Rog Frost

| Sound | . 6 |
|-------------------|-----|
| Graphics | . 7 |
| Playability | |
| Educational value | . 9 |
| Value for money | . 9 |
| Overall | . 9 |

Compilation of the old and new

Program: Action Pack 2

Price: £4.99

Supplier: Alligata, 1 Orange Street, Sheffield S1 4DW. Tel: 0742 739061

THIS collection of four games - some of them new - is only available from branches of W.H. Smith.

The first game on the tape, Video's Revenge, is a shoot-them-down space game using good quality, smooth graphics and adequate sound.

You can move your craft left or right as well as forwards and backwards, and the various nasties approach from above or below.

Like so many of these games it's simple but addictive. I really like the title screen which has a message scrolling across the screen while the game loads.

Q-Bix is a version of the classic in which you steer a character around a set of cubes, changing the colours of the top surfaces.

Of course there are adversaries who

try to bump in to you and cause you to lose one of your lives.

This game has poor graphics and is painfully slow. It will soon have you reaching for the Break key.

Tarzan Boy is an oldie and was reviewed as a single game in December

For those who missed that review Tarzan Boy is a four screen ladders and levels game, with an awful lot of problems to overcome.

Getting on to screen two is my limit in this attractive, smooth and flicker-free game. It is a little slow, but by hitting Break the game restarts with no sound, and a lot more speed.

The final game is Diamond Pete and this obviously has its origins in Repton. The aim is to collect 16 diamonds from each of 10 screens without letting any rocks fall on your head.

An added problem is the severe time limit. There are said to be 10 levels as well as the 10 screens, but I never got the chance to find out.

There is no way that this matches the



outstanding quality of Repton, but it is very good. It's smooth, fast and has good sound.

The problems are well thought out, and it provides a very good challenge.

Overall I thoroughly recommend this package. Three of the games would make excellent singles, so it is a real bargain to get all of them at such a low price.

Rog Frost

| Sound | | 6 |
|-----------|-------|----|
| Graphics | | 8 |
| | y | |
| Value for | money | 10 |
| | | |

Welcome back old space friend

Program: Thrust Price: £7.95

Supplier: Superior Software, Regent House, Skinner Lane, Leeds LS7 1AX.

Tel: 0532 459453

REMEMBER the days when Space Invaders were king, and the buzz which went round the arcades when Galaxians appeared? If you do then you must buy yourself a copy of Thrust from Superior Software. Loading up Thrust was like discovering an old master in the attic.

Your spacecraft and all buildings and gun emplacements are displayed as high resolution line drawings.

The game is played as a series of missions of increasing complexity. In the first one the drive unit is on the planet's surface, along with a fuel dump, gun emplacement and nuclear reactor. In subsequent missions the drive will be located in underground caverns.

Fuel can be taken on board by hovering over the dump and activating the tractor beam. Hovering is achieved by pointing the ship away from the planet and using short bursts of thrust to counter the effects of gravity.

The gun emplacements are deadly accurate but can be taken out by a single shot. Firing at the nuclear reactor will halt the operation of the guns for a short while.

Having located the drive unit, the tractor beam can be used to tow it behind your ship, and this is where the fun really begins.

The programmer must be either an ace physicist or an articulated lorry driver, because the drive unit hangs beneath the ship like a pendulum attached to a fixed point on the ship by a solid bar.

Each movement of your craft will cause a realistic movement of the pendulum. As a pilot you must fly as smoothly as possible, counteracting every swing of the drive unit.

Should the swing become uncontrollable you will surely be dragged into a cavern wall.

The mission is completed by towing the drive unit into space and jumping into hyper space. As with every good arcade game, there is an opportunity for the arcade aces among you to earn big bonus

Having emerged from the cavern with drive unit in tow you can fire on the reactor until it goes critical, at which point



you have five seconds to make your hyperspace jump. This feat of bravado will earn you an additional 2000 points.

Thrust is a classic game, a game at which the natural games player will excel. This is a definite contender for my game of 1986.

Jon Revis

| Sound: | |
|-----------------------|-----|
| Graphics: | . ! |
| Graphics:Playability: | 10 |
| Value for money: | 10 |
| Overall: | |

Commanding the star wars

Program: Star Force Seven

Price: £2.99

Supplier: Bugbyte, Liberty House, 222 Regent Street, London W1R 7DB. Tel:

01-439 0666

STAR Force Seven is a military strategy game set in a futuristic space context.

You take the part of the space fleet commander, battling for 25 planets and trying to prevent the marauding Zurgs from invading Earth.

Your first task is to decide how many of the various types of spacecraft you require. You have a limited number of points and must choose carefully between cruisers, transporters, spy ships and so on.

Having made your decision, you decide which star to visit first. There are 26 stars and, to make life easy, each starts with a different letter.

When you reach a star your main options begin. You can get intelligence reports on the size and population of the various planets.

You may move into orbit around a planet and assault it or bombard it. If there are any enemy space fleets around you can attack them either in a random way or by picking off individual craft.

If the pressure gets too much for you you can do a star jump and hope to find somewhere safer and quieter.

This is not an arcade type of game so there is no graphic action which you control. You make general decisions and the computer then carries out the action.

When you are battling to win a planet the display consists of the numbers of troops remaining, both your own and those of the enemy.

I found this game rather dull to play. It looks like the kind of game that we had five or six years ago when computers had limited graphics capabilities.

It does not offer a real chance to use your own skills and relies too much on random happenings.

Another factor I disliked was that on being destroyed I had to reload data to be able to play again.

I'm afraid I even found the rather limited sound an irritant. Thankfully this can be switched out.

There are five difficulty levels ranging from easy to difficult, but even level 1 was too hard for me.

If you like this kind of strategy game no



doubt you would be pleased to add this to your collection. I'd prefer to invest my money elsewhere.

Rog Frost

| Sound | 3 |
|-----------------|---|
| Graphics | 4 |
| Playability | 4 |
| Value for money | 6 |
| Overall | 4 |

Rick, the supreme secret agent

Program: Rick Hanson

Price: £9.95

Supplier: Robico, 3 Fairland Close, Llantrisant, Mid Glamorgan CF7 8QH.

Tel: 0443 227354

ROBICO is well known for the quality of its BBC adventures and so it was with some interest that I tackled its first Electron game.

You play the part of Rick Hanson, secret agent. Your mission is to assassinate General Garantz, an evil criminal who is threatening to explode a nuclear bomb in New York unless he is paid a ransom.

You begin your mission in a railway station. An initial exploration of the 14 locations surrounding you reveals several objects, all of which are useful.

A visit to the telephone box should give you further information about your mission, but reversing the charges is a throw-away line.

After collecting everything else you can find you must look for a route out of the station. Leaving by the front door is not the answer as you will soon discover.

Hesitation can also prove fatal as one

of the general's men is somewhere inside looking for you with evil intent.

To get on the right track, or rather over it, head back to the bridge. A passing train is on, and in time.

The guard should be dealt with quickly, so put a spanner in his works. Leaving the train will find you in a village with more exploring to do.

There's lots to do here and if you take a gamble in the tavern you will find you can stay the night.

You must now try not to avoid too close a shave, and cracking the code should see you well equipped to solve the remaining puzzles before leaving the village.

I am very impressed with this game. It has about 220 locations and is totally logical. Packaged with the game is a card which entitles you to help if you get stuck.

Also enclosed is a smart adventurer's notebook. This is about the size of a diary and consists of blank, coloured pages. I'm not sure how useful this is, but it does add an air of professionalism to the game.

The program uses screen memory because of its size so you only see 18 lines of text at any one time.

Rick Hanson is nothing less than



brilliant and Robico must now join Epic as being the software houses for adventures on the Electron.

I look forward to spending time on the follow-up version, Rick Hanson II, which from initial impressions seems to be every bit as good.

Paul Gardener

| Presentation | 9 |
|--------------------|------|
| Atmosphere | 9 |
| Frustration factor | |
| Value for money | . 10 |
| Overall | |

HOWZAT! simulates a full innings between England and Australia or teams of your choice. After entering the teams you want you must choose which players are to bowl, in order of skill. The game then begins.

Once into the game you are shown the scorecard at the beginning of each over and select a new bowler. The current batsman facing and the last bowler are highlighted.

The player controlling the fielding team should press 1 to 6 - but not the previous bowler's number - to select the new bowler. The batting player can press D to declare.

The main screen is a graphic representation of the pitch. At the top is the scoreboard showing the teams' scores, wickets lost, the batsmen's scores and the bowler.

The Electron will automatically bowl and try to hit the ball - success depends on the respective skills of the bowler and batsman. If the ball is hit the player batting will be asked if he wishes to run or not.

If he does the batsmen will dash across the wicket while the nearest fielder will attempt to run them out. LBWs, catches, bowled-outs and drops are all computer controlled.

Every time a wicket is lost the program will return to the scorecard to select the new batsman.

If you wish to have a limited overs game then simply declare after a fixed number of overs.

If you want to play twice hence a two innings match - then you won't want the program to automatically declare after the second player has exceeded the first's score, so change line 670 to:

678 UNTIL wkx(TX)=18 OR declaredI

T%

0%

ov% X%,Y%

bt1%

bwn%(5,1)

bws%(5,1)

bts%(10,1)

n\$(11,1)

W%

VARIABLES

Current team.

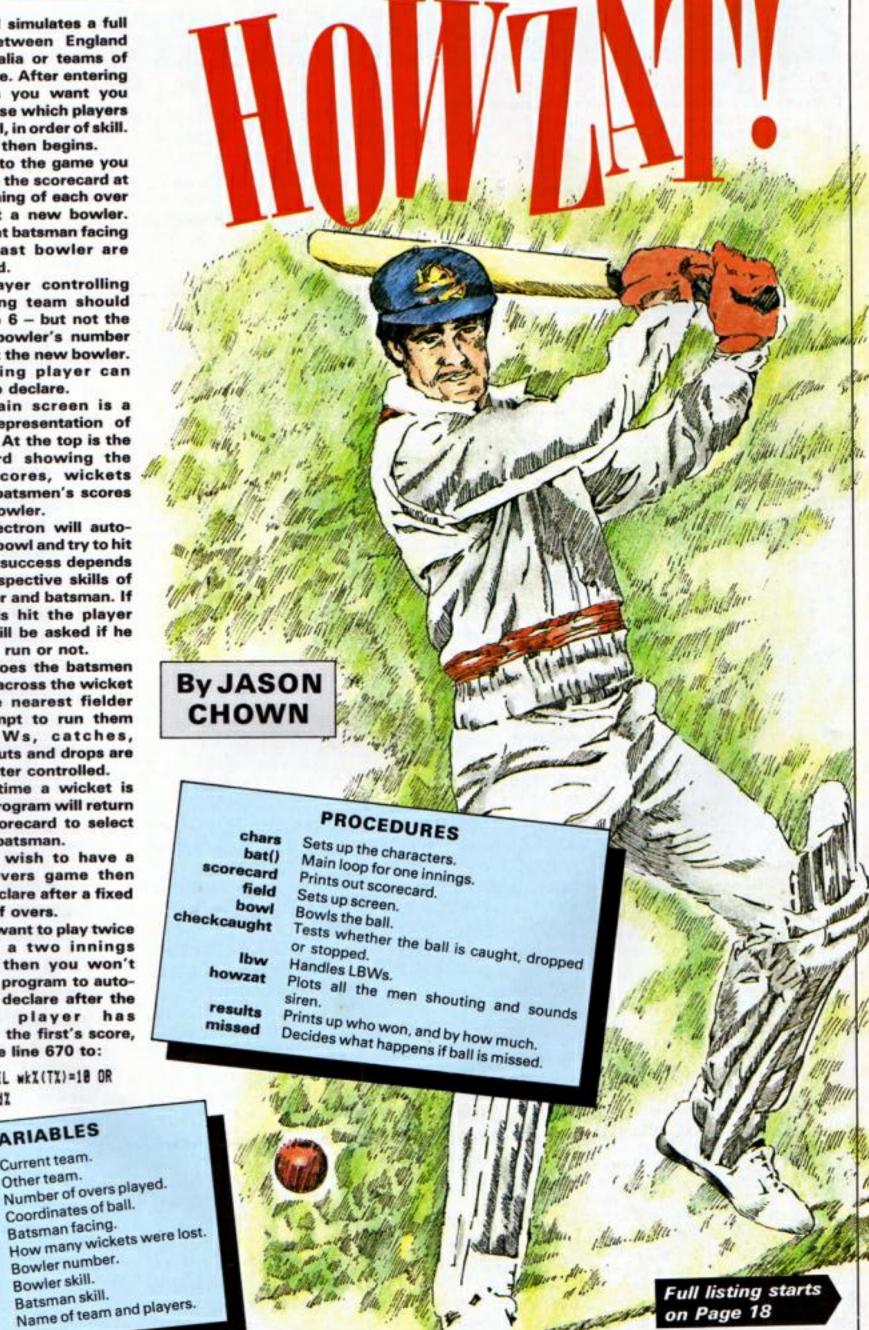
Batsman facing.

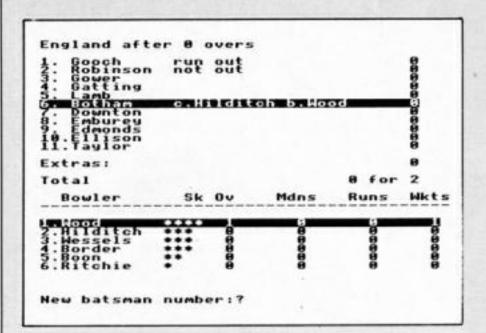
Bowler number.

Batsman skill.

Bowler skill.

Other team.





From Page 17

18 REM Howzat!

28 REM A cricket game

38 REM for two players

48 REM By Jason Chown

50 REM with ideas from

68 REM Christian Chown

78 REM (c) Electron User

88 +FX228 17

98 DATAEngland, Gooch, Rob inson, Gower, Batting, Lamb, Bo tham, Downton, Emburey, Edmond s, Ellison, Taylor

188 DATAAustralia.Wood,Hi lditch,Wessels,Border,Boon, Ritchie,Phillips,Holland,La wson,O'Donnel,McDersott

110 MODE4: PROCchars

128 PRINTTAB(5,18) Press

D for default teams

138 PRINTTAB(5,12)*(Engla nd v Australia)*

148 PRINTTAB(5,14) or I t

o input your own teams." 150 PRINTTAB(5,17)"Please

ensure Caps lock is on."

168 REPEATA\$=GET\$:UNTILA\$

="I"ORA\$="D"

178 ENVELOPE1,18,1,-1,0,1 ,1,8,126,8,8,-126,126,126

180 DIM n\$(11,1),bwn%(5,1),bws%(5,1),bts%(18,1),rn%(

11,1),bwf%(5,1,3),ho\$(18,1)
,wk%(1),tot%(1)

100 V-DUD/-TIME

198 X=RND (-TIME)

200 CLS

1

218 IFA\$="I"COLOUR129:COL OUR8:PRINTTAB(12,1)"ENTER N AMES":VDU28

228 FORTX=8T01:FORMX=8T01

238 IFA\$="D"READn\$(MX,TX)

ELSE PROCinput

248 NEXT.

250 FORTX=0T01:MODE4:PRIN T'TAB(15);:COLOUR8:COLOUR12 9:PRINTn\$(0.TX):COLOUR1:COL OUR128:PRINT'" name bat ting skill bowling":FOR MX=1T011

268 btsX(MX-1,TX)=(18-MX/ 2) +VAL(*1.*+STR\$(RND(9)))

278 PRINT; MZ; ") "; n\$(MZ, T Z) TAB(15); STRING\$(btsZ(MZ-1 , TZ)/4+1, "+")

288 NEXT

298 PRINT"

300 FOR BX=0T05:REPEATPRI NTTAB(0,20)SPC(40)::INPUTTA B(0,20)"Bowler number: "NX

310 FX=0:FORSX=0TOBX:IFbw nX(SX,TX)=NXFX=-1

328 NEXT

338 UNTILNOTFXANDNX>8ANDN X<12

348 PRINTTAB(26,NX+3) "Bow ler no."; BX+1:bwnX(BX,TX)=N

358 bws%(B%,T%)=(8-B%+1.5)+RND(4)

368 NEXT:PRINTTAB(8,38)*P ress any key to go on..":A= GET

378 NEXT

388 VDU23:8282;8;8;8;

398 VDU19,0,2;0;19,1,0;0;

400 PROCtossup

418 ov%=8

428 declared%=8

430 PROChat (8):10%=0v%

448 declared%=8

450 PROCbat (1)

468 PROCresults

478 END

488 DEFPROCchars

498 VDU23,224,8,188,146,1 46,146,146,146,146,23,225,3 8,16,98,98,82,82,76,76

500 VDU23,226,0,0,0,0,56, 56,56,16,23,227,68,121,185, 56,56,40,68,66,23,228,60,12 1,185,56,56,40,40,40

510 VDU23,229,156,92,60,3 0,29,40,68,66,23,230,0,0,0, 0,112,112,112,32,23,231,112 ,120,116,116,116,84,84,80,2 3,232,112,120,116,116,114,8

4,80,80,23,233,56,120,184,1 84,184,168,168,40

520 VDU23,254,0,0,0,0,0,1 29,153,90,23,255,90,126,60, 60,60,36,36,102

538 ENDPROC

540 DEFPROCinput

550 IF MX=0 a\$="Team "+ST R\$(TX+1)+":" ELSE a\$="Playe r "+STR\$MX+":"

568 PRINTTAB(TZ+28,MZ+4-(MZ)8))a\$:

578 INPUT "n\$ (MX, TX)

580 ENDPROC

598 DEFPROChat (TI)CLS

688 bt1%=1:bt2%=2:bn%=6

610 REPEATruns%=8:ho\$(bt1 %-1,T%)="not out":ho\$(bt2%-1,T%)="not out":PROCscoreca rd:PROCnewbowler

628 FDRbowls%=1T06

630 IFwk%(T%)(10ANDNOT(T% =1ANDtot%(0)(tot%(1))ANDNOT declared%PROCfield:PROCbowl

640 NEXT: IFNOTdeclared% o

658 AX=bt1X:bt1X=bt2X:bt2 X=AX

668 IFNOTdeclared%PROCadd 678 UNTILwk%(T%)=180Rdecl ared%OR(T%=1ANDtot%(0)<tot% (1))

680 PRINTTAB(0,31) "Inning s Closed. Press any key..." ::A=6ET:ENDPROC

698 DEFPROCscorecard

788 CLS

718 PRINTn\$(0,T%); after ";ov%; overs"

728 totX(TX)=8

720 COCATIAT-

738 FORMX=1T011: IFMX=bt1X COLOUR8: COLOUR129ELSECOLOUR 1: COLOUR128

748 PRINT; MX; ". "TAB(3)n\$(
MX,TX)TAB(13)ho\$(MX-1,TX)TA
B(36); rnX(MX,TX): totX(TX) = t
otX(TX)+rnX(MX,TX): NEXT

758 COLOUR1: COLOUR128 768 PRINT'*Extras: "TAB(36);rn%(8,T%)

778 totX(TX)=totX(TX)+rnX(8,TX)

780 PRINT'"Total"; TAB(30)
;totX(TX)" for ";wkX(TX)

798 IFov%>8 ANDT%=8 PRINT
" (averaging "; INT(tot
%(8)/ov%+188)/188;" an over

888 IFTX=1 IFovX-loX>8 PR
INT" (averaging "; INT(
totX(1)/(ovX-loX)*188)/188;
" an over)"

818 PRINT' Bowler

Sk Ov Mdns . Runs Wkts-

828 0%=-NOTT%: IFO%=20%=8

838 FORMX=8T05: IFbnX=MXC0 LOUR8: COLOUR129ELSECOLOUR1: COLOUR128

848 PRINT; MX+1; ". "TAB(2) n \$(bwnX(MX,OX),OX); TAB(12); S TRING\$(bwsX(MX,OX)/3+1, "*") ; TAB(18); bwfX(MX,OX,8); TAB(25); bwfX(MX,OX,1); TAB(32); b wfX(MX,OX,2); TAB(38); bwfX(MX,OX,3)

858 NEXT: COLOUR1: COLOUR12

868 ENDPROC

878 DEFPROCnewbowler

880 REPEATPRINTTAB(0,28)S
PC(20)TAB(0,28) *Bowler numb
er or 'D' to declare..*:A\$=
GET\$:UNTILA\$="D"OR((VALA\$>0
ANDVALA\$<(7)ANDVALA\$<(>bn%+1)

898 IFA\$="D"declared%=TRU E:ENDPROC

988 bwf%(VALA\$-1,0%,8)=bw f%(VALA\$-1,0%,8)+1

918 bn%=VALA\$-1

928 ENDPROC

938 DEFPROCFIELD CLS:REST DRE 978

948 MOVE1258,288: DRAW1188, 28: DRAW188,28: DRAW188, 28: DRAW38, 288: DRAW1 188,888: DRAW1 188,888: DRAW1258,788: DRAW12 58,288

950 PRINTTAB(18,18) CHR\$12 8TAB(38,18) CHR\$128

968 FORMX=8T09:READXX,YX: PRINTTAB(XX,YX-1)CHR\$138TAB (XX,YX)CHR\$131:NEXT

978 DATA7,28,8,21,18,23,1 3,6,18,18,31,6,7,18,31,27,2

8,25,28,14,38,28,36,28 988 READXI, YI, XX, YI: PRINT TAB(X1, Y1-1) CHR\$130TAB(X1, Y %) CHR\$131 998 PRINTTAB(28,17) CHR\$13 BTAB (28,18) CHR\$137TAB (12,17)CHR\$134TAB(12,18)CHR\$135 1000 ENDPROC 1818 DEFPROCHOWL 1020 PRINTTAB(10,0)n\$(0,T%)" are ";tot%(T%);" for ";w k% (T%): IFT%=1PRINTTAB(28,1) ;tot%(8)-tot%(1)+1; " to win ... 1838 PRINTTAB(8,1)n\$(bt1%, TX) TAB(12); rn1(bt11, T1) 'n\$(bt2%, T%); TAB(12); rn%(bt2%, T 7) 1848 PRINTTAB(15,2)n\$(bt1% .TI) " facing "n\$(bwn1(bn1,0 2),0%) 1858 PRINTTAB(1,38); bowls% 1868 FORZX=36T038STEP-1:PR INTTAB(Z%, 19) CHR\$138TAB(Z%, 20) CHR\$131TAB(ZZ+1,19) " "TA B(ZX+1,20) * ":FORcX=1T01800 : NEXT. 1878 PRINTTAB (38.19) CHR\$13 @TAB (30, 20) CHR\$133 1880 pace%=68-bws%(bn%,T%) +6: IFpace%(8 pace%=8 1898 FORB%=950TD480STEP-16 :PROCball (B%, 450-B%/15):600 LØ, 8: PROCball (BX+16, 450-(BX +16)/15):FORZ%=1TOpace%:NEX T: SCOLB, 1: NEXT 1100 PROChit 1118 ENDPROC 1128 DEFPROCHIT:PRINTTAB(1 2,18) CHR\$136 1138 +FX15 1140 SOUND8,-18,2,3 1150 out%=0 1160 1%=TRUE 1178 IFRND (48) = 1AND (bts% (b t12-1,T2)+18+RND(28))((bws% (bn2,0%)+RND(28)) PROCdout: 1%=0 1188 IFbts%(bt1%-1,T%)+RND (20) >30AND1% PROCbighit:1%= 1198 IFbts%(bt1%-1,T%)+RND (20)>17AND1% PROCdinky 1200 IF1%PROCeissed 1210 IFout%PROCnewman 1228 X=RND(-TIME) 1238 ENDPROC 1248 DEFPROCdinky 1%=8:PRO

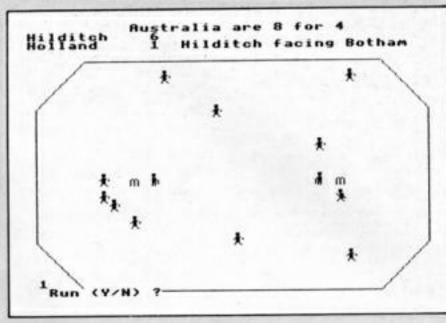
Csmallhit

1258 IF XX>188ANDXX<1178AN DYX>100ANDYX<880ANDNOToutX PROCrunning ELSE IF NOTout% PROCadd2(4):PRINTTAB(18.3) "FOUR RUNS!": A=INKEY (300) 1268 ENDPROC 1270 DEFPROCbighit A=RADRN D (368) 1288 IFRND(18)=1PROCsix:EN DPROC 1298 x %=20+COSA: y %=20+SINA 1300 XX=400+xX+xX: YX=448+y 1+v1 1318 GCOL3,1:PROCball (XX,Y 2) 1328 REPEAT 1330 PROChall (XX,YX) 1348 XX=XX+xX:YX=YX+yX 1358 A=INKEY(1) 1368 PROChall (XX, YX) 1378 UNTILPOINT (XX+xX, YX+y 2)(>8 1388 IFPOINT(XX+xX, YX+yX)= 1ANDXX>200ANDXX<1036ANDYX>1 30ANDY% < 800PROCcheckcaught: 1%=0: IFNOTout%PROCrunning: E NDPROC 1390 IFPOINT (11+x1, Y1+y1)= 1 ANDYX (880 PROCrunning: END PROC 1488 IF1%=BENDPROC 1418 REPEAT 1420 PROChall (XX, YX) 1438 XX=XX+xX: YX=YX+yX 1440 A=INKEY(1) 1459 PROChall (XX,YX) 1468 UNTILPOINT (XZ+xZ, YZ+y %) ORY%>888 1478 PRINTTAB(18,3) FOUR R UNS! * 1488 totX(TZ)=totX(TZ)+4: I FABS(y%) <18ANDx%<-18PRINTTA B(15,4)*(extras)*:rn%(0,T%) =rn1(0.T1)+4ELSErn1(bt11,T1)=rn2(bt12,T2)+4:runs2=runs 1498 A=INKEY(488) 1500 ENDPROC 1518 DEFPROCSIX 1528 x X=20+COSA: y X=20+SINA 1538 XX=488+xX+xX: YX=448+y 1+y1 1540 GCOL3,1 1550 PROChall (XX.YX) 1568 REPEAT 1578 PROChall (XX,YX)

1588 XX=XX+xX:YX=YX+yX

1600 PROChall (XX, YX)

1590 A=INKEY(1)



1618 UNTILPOINT (XX+xX, YX+y X)=TRUE 1628 PROCadd2(6) 1638 PRINTTAB(18,3)" S I X RUNS !!" 1648 SOUND1,1,56,48 1658 A=INKEY(488):ENDPROC 1668 DEFPROCsmallhit A=RAD RND (368) 1678 x X=20+COSA: y X=20+SINA 1688 XX=480+xX+xX: YX=448+y 1+v1 1698 GCOL3.1 1780 PROChall (XX, YX) 1718 REPEAT 1728 PROChall (XZ, YZ) 1738 XX=XX+xX: YX=YX+yX 1740 PROChall (XX,YX) 1758 A=INKEY(3) 1760 al=RND(6):UNTILPOINT(11+x1,Y1+y1)<>80Ra1=6 1778 IFPOINT(XX+xX, YX+yX)(>0ANDXX>100ANDXX<1170ANDYX> 108ANDYX (808PROCcheckcaught :ENDPROC 1788 ENDPROC 1798 DEFPROCdout 1888 17=8 1818 IFRND(6)=1PROCdinky:E NDPROC 1820 IFRND(4)=1PROCkeeper: ENDPROC 1838 IFRND(4)(4ENDPROC 1848 IF (bts%(bt1%-1,T%)+18 +RND(20)) < (bws%(bn%,U%)+RND (20)) PROCbowled 1858 IFRND(18)=1PROC1bw:EN DPROC 1868 ENDPROC 1878 DEFPROCKeeper: PRINTTA B(10.3) "Wicket Keeper";: A=I

NKEY (100):1%=0:ENDPROC

1888 DEFPROCcheckcaught IF

1898 IFRND(2)=1ENDPROC 1988 PROCfnear 1918 IFNX+1=bnX REPEATNX=R ND(11)-1:UNTILNX<>bnX 1928 PRINTTAB(10.3) "droppe d by "n\$(NX+1,0%):ENDPROC 1938 DEFPROCIEW PROCHOWZat :out%=TRUE:PRINTTAB(10,31) L.B.W. (b.";n\$(bwn%(bn%,0%) .OX);")"::A=GET:ho\$(bt1%-1, TZ)="L.B.W. b."+n\$(bwnZ(bnZ .OX).OX):ENDPROC 1940 DEFPROCadd 1950 bwf%(bn%,0%,2)=bwf%(b n%,0%,2)+runs% 1968 IFrunsX=@bwfX(bnX,0%, 1) =bwf%(bn%,0%,1)+1 1978 IFbwf%(bn%,0%,0%)MOD2= 8bws%(bn%,0%)=bws%(bn%,0%)-1 1988 ENDPROC 1998 DEFPROChall (XX,YX) 2000 PLOT69, XX, YX: PLOT69, X 7. YX+4 2818 ENDPROC 2828 DEFPROCHEMEAN 2838 wk%(T%)=wk%(T%)+1 2848 IF hos(bt1%-1,T%)()"r un out"bwf%(bn%,0%,3)=bwf%(bn%,0%,3)+1 2050 PROCscorecard 2868 IFWKX(TX)=18ENDPROC 2070 REPEAT 2088 REPEATPRINTTAB(0.30)S PC(30) TAB(0,30) "New batsman number: ":: INPUTAZ: UNTILAX> BANDAX<12 2090 UNTILho\$(A%-1,T%)="" 2188 bt1%=A%:ho\$(A%-1,T%)= "not out"

RND (3) = 1PROCcaught: ENDPROC

Howzat listing

From Page 19

2110 ENDPROC 2120 DEFPROCcaught RESTORE 978

2130 PROCfnear

2148 n\$=n\$(NX+1,0X)

2150 IFn\$=n\$(bwn%(bn%,0%),

0%) PROCrndman

2160 IFNX=10A\$="c & b "+n\$ (bwn%(bn%,0%),0%)ELSEA\$="c. "+n\$+" b. "+n\$(bwn%(bn%,0%).

07)

2170 PROChowzat 2188 PRINTTAB(8,38) "HOWZAT

! ("A\$")"'"Press any key...

"::out%=-1:ho\$(bt1%-1,T%)=A \$: A=GET: ENDPROC

2198 DEFPROCENDEAN

2288 REPEATN%=RND(18)-1:n\$

=n\$(N%+1,0%)

2210 UNTILn\$()n\$(bwn%(bn%,

0%),0%)

2220 ENDPROC

2230 DEFPROChowzat

2240 RESTORE970

2250 FORSX=0T010: READXX, YX

2260 PRINTTAB(XX, YX-1) CHR\$

254TAB(XX.YX)CHR\$255

2278 NEXT

2280 SOUND1,1,100,48

2290 ENDPROC

2300 DEFPROCbowled hos(bt1 1-1,T1)="b. "+n\$(bwn1(bn1,0 1),0%):PRINTTAB(10,18)CHR\$1

29: PRINTTAB (0,30) "HOWZAT! (bowled "n\$(bwn%(bn%,0%),0%)

")"'"Press any key...";:PRO Chowzat: A=GET: out %=-1: ENDPR

2318 DEFPROCresults:CLS 2328 PRINTTAB(18.18) "RESUL

2330 PRINTTAB(5,15)n\$(0,0) : TAB(28):tot%(8):FNwk(wk%(8

2340 PRINTTAB(5,20)n\$(0,1)

: TAB(20): totX(1): FNwk(wkX(1

2350 IFtot%(0)>tot%(1)PRIN T''SPC(10)n\$(0,0)" win by " ;tot2(8)-tot2(1); " runs."

2368 IFtat%(8)(tat%(1)PRIN T''SPC(10)n\$(0,1)" win by " ;10-wk%(1);" wickets."

2370 IFtotX(0)=totX(1)PRIN T' SPC(10) TAB(10) "match dra

Wn."

2380 ENDPROC

2398 DEFFNwk (WX) IFWX=18:=" all out "ELSE: = " for "+STR\$ (W%)+" dec."

2400 DEFPROCadd2(a%) IFXX(0 ANDABS(YX)(200PRINTTAB(25,3) "(extras) ":rn%(0,T%)=rn%(0

.TX)+aX: ENDPROC 2410 rn%(bt1%, T%)=rn%(bt1%

.T%) +a% 2420 IFaXMOD2=1 AX=bt1X:bt 1%=bt2%:bt2%=A%

2438 totX(TX)=totX(TX)+aX 2448 runs%=runs%+a%:ENDPRO

2450 DEFPROCmissed

2460 AZ=RND (40) 2478 IFAX=1 PROCIDM: ENDPRO

2480 IFAX(4 PROCbowled: END PROC

2498 IFAX(18 PROCdinky: END PROC

2500 IFAX=10 PROCbighit:EN DPROC

2518 PROCkeeper: ENDPROC

2520 DEFPROCtossup CLS

2530 DX=RND (-TIME)

2548 AX=RND(2)

2550 PRINTTAB(5.8)n\$(0.A%-1)" wins the toss..."

2560 PRINTTAB(10,10) "Bat f

irst or second ?"

2570 PRINTTAB(15,14)"1/2" 2588 REPEATBX=GET-48: UNTIL

AX>BANDAX<3

2598 IFAX()BXPROCSWAD

2600 ENDPROC

2618 DEFPROCSWAP

2620 FORTX=0T011: A\$=n\$(TX, 0):n\$(T%,0)=n\$(T%,1):n\$(T%,

1)=A\$:NEXT

2638 FORTX=0T010:AX=btsX(T 1.8):bts1(T1.8)=bts1(T1.1):

bts%(T%,1)=A%:NEXT

2640 FORTX=0T05: AX=bws% (T% .8):bws%(T%,8)=bws%(T%,1):b

#5% (T%, 1) =A%

2658 AX=bwnX(TX,8):bwnX(TX .0)=bwn%(T%,1):bwn%(T%,1)=A

%: NEXT

2660 ENDPROC

2670 DEFPROCrunning

2680 PRINTTAB(0,31)* Run

(Y/N) ?";

2690 SX=0:6X=0

2700 REPEATA\$=GET\$:UNTILA\$

="Y"ORA\$="N"

2710 PRINTTAB(0,31)SPC(20)



2720 IFA\$="N" ENDPROC 2738 PROCfnear: XX=XX/32: YX

=(1023-YX)/32 2748 REPEATS%=5%+1

2750 PROCrun

2760 IF NOTout% PRINTTAB(0 .31) " Run (Y/N) ?"::REPEAT A\$=GET\$:UNTILA\$="Y"ORA\$="N" 2778 PRINTTAB(0,31)SPC(28)

2780 UNTILout%ORA\$="N" 2798 IFNOT out% PROCadd2(S %) ELSE PROChowzat:PRINTTAB (10,31) "Run out":: A=GET:out %=TRUE:ho\$(bt1%-1,T%)="run out*

2800 ENDPROC

2818 DEFPROCEnear

2828 RESTORE978

2838 NSX=1000:NX=8

2840 FORWX=1T011

2850 READAL, BI: IFABS (AI-XI /32)+ABS(B%-(1823-Y%)/32)(N SX NSX=ABS(AX-XX/32)+ABS(BX

-(1023-YX)/32):MXX=AX:MYX=B

X: NX=WX-1 2868 NEXT

2870 ENDPROC

2880 DEFPROCrun

2898 NX=12: REPEAT

2988 IF 6% PROCthrow ELSE

PROCaove

2910 PRINTTAB(MXZ, MYZ-1)CH R\$13@TAB(MXX,MYX)CHR\$131

2920 PROCaen

2930 UNTILout% OR N%=28

2940 ENDPROC

2950 DEFPROCaove

2960 PRINTTAB (MXX, MYX) " "T AB(MXX, MYX-1)" "TAB(18,18)C HR\$128

2970 IFMXX>XXANDNXMDD2=1 M XX=MXX-1

2980 IFMXX<XXANDNXMDD2=1 M XX=MXX+1

2998 IFMYX(YXANDNXMOD2=1 M YZ=MYZ+1

3000 IFMYX>YXANDNXMOD2=1 M Y%=MY%-1

3818 IFMXX=XXANDMYX=YX GX= TRUE: XX=XX+32: YX=1023-YX+32

3020 ENDPROC

3030 DEFPROCMEN PRINTTAB(N %,17) " "TAB(N%,18) " "TAB(48 -NZ,17)" "TAB(40-NX,18)" "

3848 NX=NX+1

3050 PRINTTAB(NZ,17)CHR\$13 @TAB(N%, 18) CHR\$131TAB(40-N% ,17) CHR\$130TAB(40-NZ,18) CHR

\$131:ENDPROC 3060 DEFPROCTHrow

3070 GCOL0,0:PROCball (XX,Y 2)

3080 IFXX>330 XZ=XX-16

3898 IFXX<338 XX=XX+16

3100 IFYX<448 YX=YX+16 3110 IFYX>448 YX=YX-16

3120 SCOLO, 1: PROChall (XX, Y

3130 IF ABS(XX-330)(20ANDA BS(YX-448)(28 outX=TRUE:PRI NTTAB(18,18) CHR\$129: PRINTTA B(MXZ,MYZ) " "TAB(MXZ,MYZ+1)

3140 ENDPROC

. .:

This listing is included in this month's cassette tape offer. See order form on Page 53.

IF you own Acornsoft's excellent word processor View, but have been disappointed to find that it does not allow you to use different print styles within a document, then this routine is for you.

The manual says a printer driver is needed to allow underlined or bold text. Such a driver is available for Acornsoft on cassette for around £10. It contains a collection of routines for different printers.

The program presented here sets up a printer driver for use with any Epsoncompatible printer.

It allows eight different print styles – underlined, bold, italics, double strike, NLQ, condensed, elite, enlarged or just about any combination of these.

The driver also provides a pad character, or absolute space facility.

View sets aside one page of memory, &400 to &4FF, for a printer driver. Unfortunately the routine must be written in machine code, and very efficiently too, to cram as much useful code as possible into the 256 bytes available.

Program I sets up the required machine code routine and saves it to tape or disc.

It is essential that the program is entered very carefully as typing errors in assembly language are extremely difficult to spot and any mistake will only become evident when View refuses to print out your document correctly.

The driver code is saved under the name GLP since this is the name of my printer – a Centronics GLP. It would be wise to save the program itself as well, under a different filename such as Driver.

After entering View type:

PRINTER GLP

or whatever you've called the driver, and press Return. The driver should load, and if all has gone well PRINTER GLP should appear on the screen underneath Screen Mode 6.

Now type in or load a piece of text. The default highlights, underlining and bold printing can be selected by pressing

Ring the typograhpical changes

IAN BROWN shows how to do it with his View Printer Driver

Func+H or Func+J before and after the text to be highlighted.

You'll see an inverse dash or asterisk printed on screen. However to select other print styles the HT stored command must be used.

Each of the eight print styles provided by the printer driver has a code, as shown in Table I. You will see that the codes 128 and 129 correspond to the two default highlights.

To select italics in place of underlining for instance, you would need to set one of the highlights to produce code 130.

Press Func+O to enter a stored command in the margin and enter HT followed by Return and type 1 130. You've now altered highlight 1, Func+H to print text in italics.

The same can be done with highlight 2, Func+J. For instance, enlarged text can be selected in place of bold

| Code | Highlight |
|------|---------------|
| 128 | Underline |
| 129 | Bold |
| 130 | Italics |
| 131 | Double strike |
| 132 | NLQ |
| 133 | Condensed |
| 134 | Elite |
| 135 | Enlarged |

Table I: Highlight codes

printing by using HT 2 135. Func+J will then produce enlarged print.

Take a look at Figure I to see how it's done.

It may seem from this that only two separate print styles can be used at any time. However, remember that a highlight code selected on a previous line will not be cancelled unless actually switched off so it is in fact possible to have double strike, underlined, enlarged, condensed, bold, italic printing if your printer can cope with that combination!

The printer driver switches off the paper end detector to allow printing right up to the end of the page if cut sheets are used.

As mentioned earlier, the driver also provides a pad character facility. Whenever an absolute space is required, that is one which will not be affected by formatting, type £ instead of pressing the Spacebar.

Thus typing:

ELECTRONEUSER

will ensure that:

ELECTRON USER

is printed out with no extra formatting spaces, and not split over two lines.

In the actual printout the £ sign is replaced by a single space.

The f character, CHR\$(96) was chosen as the pad

character because, on most printers, this code is printed as the largely useless 'sign. The printer driver simply intercepts this code and replaces it with CHR\$(32).

You can alter the pad character by changing the 96 in line 530 and if you want to print a £ use a hash instead which will print as a £ if the English character set has been selected.

The printer driver is loaded by View into page 4 of the Electron's memory. However the machine code cannot be assembled here because it is used by Basic to store the integer variables A% to Z%.

Therefore the code must be assembled elsewhere, but as if it was at &400 using OPT 4 and 6. This directs the assembler to assemble the code as if it was at P% but to store it at 0%.

View expects a jump table to be between &400 to &40E. The first JMP instruction, at &400, is called when a character is to be printed.

The second and third JMPs are executed to switch the printer on and off respectively.

The final two JMP instructions are associated with microspacing, but since most printers do not support proportional spacing there seemed little need for the driver to support this facility, and so

From Page 21

they just point to an RTS command.

The subroutine *pron* starting at line 180 is called to switch the printer on. It checks the location labelled *init* to see if this is the first time the routine has been called.

If it is, the printer is initialised by sending Esc @. Also the paper end detector is switched off. The codes for these two operations are held at location intab and can be altered if required.

The bulk of the program is concerned with printing and selecting highlight codes. The routine *char* is called with the code of the character to be printed in the accumulator.

Line 310 checks to see if the character code is less than 128: If it is the character is a normal printable one, and control is passed to *norm*.

This replaces any £ with a space (the pad character facility) and sends the character to the screen and the printer.

If the character code lies

The View printer driver generator is first leaded from disc or tape then the text can be loaded or typed in.

This is an example of normal text. To print underlined text you need to insert highlight 1 by pressing funcing just before the text and again at the end. This next priece of text is underlined.

Hormal text. Dunderlined texts. and back to normal. Bold text is highlight 2 - press funcial like DOLD TEXTS and the text between the markers will be printed in bold.

To use one of the other highlights you need to change the gode produced by funcial or funcial. Press funcial, type HT followed by Return and enter 1 135 like:

HT 1 135

How Highlight 1, (Funcial) will produce code 135 which is enlarged print. This is Genlarged and this is normal.

Of course you can do the same with highlight 2. (Funcial) as well, and they can be changed as often as necessary to produce the required style of text.

Figure 1: The View editing screen showing highlights

between 128 and 135 this signifies a highlight command. Codes greater than 135 are ignored.

128 is subtracted from the code to give a value between 0 and 7. Line 340 then multiplies this value by 8 to index into the printer control code table stored at line 770.

Each of the lines 770 to 840 contain four bytes, one line for each highlight. Esc code &1B is omitted since the routine assumes that all highlights are Escape code sequences.

It is necessary to have some means of knowing whether a highlight is currently on or off.

This information is con-

tained in a single byte, labelled buffer in line 710. Each of the 8 bits in this byte corresponds to one highlight: 1 for on and 0 for off.

All printers are different and yours may require different control codes to mine, so you'll need to change the codes contained lines 770 to 840.

For instance, suppose that your printer requires the sequence Esc A 0 to turn on italics and Esc A 1 to turn off italics.

First forget the Esc code, since all the highlights are considered to be Esc sequences, and convert the rest to hexadecimal Ascii codes.

So it's &41 plus either &30

to turn on italics or &31 to switch off italics.

In the control code table &FF means the next two bytes switch the effect on and off so the data would be &41,&FF,&30,&31.

In assembly language this translates to EQUD &3130FF41. Notice that the four bytes following EQUD are written in reverse order. You would replace line 790 with:

790 EQUD &3130FF41

That's about it. Remember to type the program in very carefully, and with a bit of practice you'll be producing professional documents with varied type styles.

| M View | Printer | 260 .proff | LDA #3:JSR os | 498 | JMP finish | 730 .xbuf EQUB 0 |
|--------------------------|--|--|--|--|---|--|
| | | | | 500 .ok | JSR send | 748 .ybuf EQUB 8 |
| M By Ia | n Brown | and the latest and the | RTS | 510 | INX | 750 .intab EQUD &381848 |
| | | | Victoria de la companya del companya de la companya del companya de la companya d | 528 | JMP loop | B |
| | | | Committee of the Commit | 538 .nore | CMP #96: BNE n | 760 .table \printer code |
| wrch=&F | FEE | | | otpad | | 5 |
| | 201 | | | 548 | LDA #32 | 778 EQUD &8881FF2D \HT 1 |
| | 1071 T | | *************************************** | 550 .notpad | JSR osasci | 8 |
| | T. Thomas and the second | | CMP #174-RPI | 560 .finish | LDA abuf | 788 EQUD &884645FF \HT 12 |
| | | | OH 4100.01 F | 578 | LDX xbuf | 9 |
| | | | SEC+SRC #128 | 588 | LDY ybuf | 798 EQUD &883534FF \HT 13 |
| A 35 TA NO | | | | 598 | RTS | |
| NAMES OF THE OWNER, WHEN | MP char | | | 600 . send | PHA | 888 EQUD &884847FF \HT 1 |
| | | 107777 | 2.247 | 618 | LDA #1:JSR os | 1 |
| To T | | | CON WELLOUN 3 | wrch | | 818 EQUD &88884645FF \HT |
| | ATTACK TO THE PARTY OF THE PART | 4507 | I no table Y | 628 | PLA: JSR oswrc | 132 |
| | 100 | The state of the s | | h . | | 828 EQUD &88128FFF \HT 1 |
| EPOPAVERSON: | | 7.77 | T103-1017707 | 638 | RTS | 3 |
| | UN #2100K US | 1 2 2 2 | 7.77 | | | 838 EQUD &88584DFF \HT 1 |
| 1 | DA init-BUE | 1777 | CDN GOOTTOCOL | | | 4 |
| 100 | on Interest | 500000 ATO | TAV-1 DA #1 | | | 848 EQUD &8881FF57 \HT 1 |
| 1 | ny #0 | 1000 | | | INY | 5 |
| 100 | | 25 February 1 (1) (1) (1) (1) (1) (1) (1) (1) (1) (| | The second secon | Take the same of the same of | 850 1 |
| roup L | DH INCEDIAGE | 277 | 200000000 | | | 860 NEXT |
| , | WY | 1.07. | | | TYA | 878 FOR 61=01 TO (91+4FF |
| | | | Von Tray, DEM | DEDUCTION OF THE PERSON OF THE | 107.7377 | :?bX=0:NEXT |
| | A SAIDUE XI | | TNY | The state of the s | | 888 OSCLI SAVE GLP "+STR |
| | ur init | | | | | *QX+* +188* |
| A17 D | COLUMN TO THE REAL PROPERTY OF THE PARTY OF | | | | | *************************************** |
| | M Dr M By Ia M (c) E wrch=&Fl asci=&F M QX &11 R I=4 T F I J f I I J f I | M By Ian Brown M (c) Electron User Wrch=&FFEE asci=&FFE3 M QX &100 R I=4 TO 6 STEP 2 =&400 =QX PT I rint JMP char n JMP pron ff JMP proff icro JMP ret ption JMP ret ption JMP ret ption JMP ret ption JMP ret IDA #2:JSR os LDA init:BNE LDX #0 LOX | M Driver wrch M By Ian Brown 278 M (c) Electron User 288 .char 298 wrch=&FFEE 388 asci=&FFE3 318 M QX &100 nore R I=4 TO 6 STEP 2 328 =&400 finish =QX 338 PT I 348 rint JMP char 350 n JMP pron 360 ff JMP proff end icro JMP ret 370 .loop ption JMP ret 380 ron LDA \$2:JSR os 398 400 LDA init:BNE SBC \$128 410 LDX \$8 428 .yloop loop LDA intab,X:J 430 440 INX 450 .out CPX \$4:BNE x1 switch 460 INC init 470 .switch | ## Driver wrch 278 | ## Driver wrch 500 ok ## By Ian Brown 270 RTS 510 ## (c) Electron User 280 .char STA abuf 520 | ## Driver wrch Se8 ok JSR send M By Ian Brown 270 RTS 510 INX JMP loop 290 STX xbuf 538 .norm CMP #96:BNE n 290 STX xbuf 538 .norm CMP #96:BNE n 290 STY ybuf otpad asci=%FFEE 300 STY ybuf otpad S50 .notpad JSR osasci S50 .notpad S50 .notpad JSR osasci S50 .notpad S50 .notpad |



SLOGGER'S LATEST PRODUCT THE 'MASTER' RAM BOARD!!

THE 'MASTER' RAM BOARD enhances your Electron with the following features:

A massive 32K of EXTRA RAM

which means it is now possible to own

A 64K ELECTRON

An increase of your Basic programs to over

28K in any mode . . .

The screen is no longer a limitation Improves the capacity of your Word Processing system -Starword users can now use over

28000 Bytes of text in

BOTH 40 or 80 column modes

(A threefold increase in 80 column mode) VIEW files are improved to a similar extent Improves printing performances using the built-in buffer. You need no longer wait for those large documents to print . . . The 'Master' RAM board quickly absorbs these, releasing you to do other jobs.

SPEED

It increases the speed of your Electron comparable to that of the BBC

This means up to 100% improvement in all operations and as much as 300% improvement in Graphic operations.

FULLY COMPATIBLE WITH ALL ADD-ONS

(Rombox, Plus 1, Plus 3, ACP adaptors etc) Your Electron will be upgraded to 64K and returned to you within seven days of receipt by SLOGGER (using the cut out below)

ALL INCLUSIVE ONLY £64.95

Fitted and tested including carriage paid both ways PLUS 1 Year's full warranty. When ordering please quote MR-1 on Order Form.

The 'Master' RAM Board kits are available at the price of

£54.95 inc. P&P.

Please quote on order form MR-2

THE ELK TURBO-DRIVER



(DESIGNED BY ANDYK LTD) INCREASES THE SPEED OF YOUR **ELECTRON COMPARABLE TO THE BBC**

★★ UP TO 100% IMPROVEMENT IN SPEED ★★ ** ABLE TO RUN BBC SOFTWARE (Non Mode 7) WHERE SPEED WAS THE LIMITING FACTOR ** (Such as Acornsoft's Aviator Flight Simulator) ** MAKES ELECTRON SOFTWARE RUN FASTER ** CAN BE SWITCHED BETWEEN NORMAL AND 'TURBO-DRIVE'

** OPERATES IN ALL ELECTRON MODES ** ** NO SOFTWARE MODIFICATION REQUIRED **

** COMPATIBLE WITH ALL ADD-ONS Plus 1, Plus 3, Rombox, Adaptor Boards, etc) ★★

Your upgraded Electron will be returned within 7 days of receipt by SLOGGER

Parcel Post Amount of postage to be paid by

Date stamp

Postage Forward Parcel Service Licence no. GJC1

No postage stamp necessary unless posted in Channel Islands Isle of Man of Republic of Ireland

SLOGGER LTD 107 RICHMOND ROAD GILLINGHAM KENT ME7 1BR

All Inclusive ONLY £42.00 (VAT included) Fitted, Tested, Including switch, carriage paid both ways

PLEASE QUOTE T-D1 ON ORDER FORM The Upgrade 'TURBO-DRIVER' Kit available

PLEASE QUOTE ON FORM T-D2 £29.95 P&P

Slogger's unique guarantee!!!

The guaranteed seven day installation service SLOGGER is providing a unique service with guarantees to return your Electron with the "TURBO-DRIVER" or 'MASTER" RAM BOARD, installed WITHIN SEVEN DAYS OF ITS RECEIPT!!!

Simply enclose your order with your Electron (in its original packing if possible) and send using the "Free post" address label opposite.

New

ELECTRON THE ROMBOX PLUS



A direct replacement for the Acorn Plus I

★ Two Cartridge slots

★ Four ROM Sockets

★ Centronics Printer Interface

★ Joystick Interface available for the Cartridge slot. (Separate price)

Available at the Acorn User Show at the Barbican Centre - 24th to 27th July on Stand No. 38

STARWORD (16K ROM)

A Professional word Processor for UNDER £35

★ Does everything VIEW does plus MUCH MORE!

Designed for the home user, education or small business needs, STARWORD enables even those with limited typing skills to produce and print letters, manuals or reports using the Electron.

- 40 and 80 column screen modes.
- 132 column text width max.
- Variable margins and tabs.
- Formatting and justification.
- ★ Very extensive printer control facilities.
- * Very large documents, letters no problem.
- * Search, Find, replace.
- * Move, Copy, Insert.
- ★ Extensive single key editing.
 ★ Proper Mailmerge with STARSTORE & STARSTORE II.
- * Text spooling.
- ★ Headers, Footers, Page numbers.
- * Text remains through BREAK.
- * Printer driver for non-EPSON printers.
- ★ Very easy to use.
- ★ 120 page well written manual.

"It is certainly the most powerful currently available for the Electron". ELECTRON USER April '86.

ONLY £34.50

STARWORD for CUMANA DISK INTERFACE

Enhanced version of Starword using the Cumana clock to allow Day, Date and Time stamping when printing. A feature available on only the best Word Processors!

ONLY £34.50

PRINTER DRIVER for STARWORD

Use most printers with STARWORD.

ROM £9.95

PRINTER ROM

Allows use of sideways RAM as 8K or 16K print buffer and offers a host of useful utilities for EPSON printers. Ideal for all your printing requirements.

★ Electron/BBC compatible.

ONLY £24.95

ELKMAN

The most powerful ROM manager on the BBC is now available for the Electron.

ONLY £17.50

16K SIDEWAYS RAM FOR ROMBOX

- * Fully compatible with Plus 1, Plus 3, etc.
- ★ No soldering.
- Complete with RAMs.
- ★ Write protect option.

£29.95

ROMBOX

Now in its third year of manufacture, the ROMBOX still offers superb value for money giving the following features:

- ★ Runs all good (non Mode 7) BBC or Electron ROM
- ★ Fully compatible with Plus 1, Plus 3 and all Plus 1 and ROMBOX Plus add-ons.
- ★ Up to 8k ROMs instantly selectable.
- ★ Supports 8k and 16k sideways RAM.
- * Allows further expansion at rear.

STILL ONLY £44.95

ROMBOX-P

Offers all the features of ROMBOX Plus built-in centronics printer interface and FREE Printer ROM (worth over £20).

- ★ Up to 8 ROMs instantly selectable.
- ★ Selectable 8/16K Print buffer to increase throughput.
- ★ Ideal as a word-processing station with Plus 3 fitted.
- * FREE Printer ROM included.
- * Superb value for money at ONLY £69.95

STARSTORE (ON ROM)

Store and retrieve your names and addresses or any other information with the STARSTORE DATABASE, written specially for the Electron, STARSTORE works with STARWORD for personalising standard letters (mailmerging).

ONLY £21.95

STARSTORE II

- ★ New improved more powerful Database for Disk Users.
- Maximum of 90 Fields.
- Maximum 16 character Field name.
- 254 characters per field.
- Maximum records limited to size of Disk.
- ★ Formatted printing to allow fields at specific point. ONLY £29.95

CUMANA DISK STARTER PACK

- ★ 40T Single Sided Double Density **BBC** Drive
- ★ Interface slots simply into Plus I or **ROMBOX Plus Cartridges**
- ★ Uses no RAM
- ★ Additional Sideways ROM Socket
- ★ Real Time Clock & Calendar with battery and backup.

Price £169.95 with carriage etc.

VINE MICRO'S ADDCOM

★ 40 Commands.

★ Graphics, Toolkit and Logic Graphics.

ONLY £28.00

VINE MICRO'S MATRIX ROM

The Matrix ROM provides a comprehensive range of commands for performing matrix operations (including inversion).

ONLY £36.00

T2 P4

Transfers the majority of cassettes tape to ACP's Plus 4 system for much faster loading.

COMING SOON

RS423 SERIAL PORT

Has Drive capability and Software Interface as on the BBC Model "B". Plugs directly into Plus 1 Cartridge slot.

ONLY £39.99

PLUS I ROM UPGRADE

Replacement 8K Eprom to allow loading of cassette Software in High resolution Modes. Allows Basic to be called instead of being forced into another language on Switch On or CTRL-BREAK.

ONLY £7.95

T2P3

Transfer the majority of cassettes Tape to Plus 3 disk system, for much faster loading.

ONLY £19.95

T2CU

Transfers the majority of cassettes Tape to Cumana Disk system for much faster loading.

ONLY £19.95

STARGRAPH

Graphics Rom giving screen dump to EPSON printer, printing of text at any angle or any size, circle, ellipse polygons, arc, dotted lines, colour filling plus more.

ONLY £21.95

ACP's

Advanced ROM Adapter £9.95
Advanced ROM Adapter 2 £14.95

ACP's

Advanced Disk Toolkit

ONLY £34.50

SLOGGER DISK STARTER PACKS

The ACP Advanced Plus 4 Disk Interface (AP4) and a choice of disk drives from Opus the leading disk drive manufacturer:

AP4 + 40T single sided 100k drive £199.00

AP4 + 80T double sided 400k drive switchable to 40T

£229.00

Both prices include VAT and Carriage.

*TREK

A ROM disassembler with a difference. Ideal for beginners not only to Machine Code but to the Electron itself as this ROM Utility actually COMMENTS as it disassembles, a feature found in no other package.

SPECIAL INTRODUCTORY PRICE £17.50

8k Static RAM Chip **£4.00** 16k Eprom **£3.75** 8k Eprom **£3.25**

STARMON

- ★ Display of memory in: ASCII and binary, decimal, octal or hexadecimal.
- * Full support of sideways ROMs.
- ★ Comprehensive debugging facilities, including breakpoints, traces and events.
- ★ "a very professional piece of firmware"... Acorn User. ONLY £22.50

SLOGGER'S AUTHORISED DEALERS

DA COMPUTERS LTD, 104 London Road, Leicester. Tel: Leicester (0533) 549407.

WEST WILTS MICROS, 3 White Hart Yard, Trowbridge,

Wiltshire. Tel: Trowbridge (02214) 62759.

MICROWAY, 39 High Street, Rainham, Kent. Tel: Rainham (0634)

ELECTRONEQUIP, 36-38 West Street, Fareham, Hants. Tel: Fareham (0329) 230671.

GLASGOW COMPUTER DEPOT, 205 Buchanan Street, Glasgow G1 2JZ. Tel: Glasgow (041) 332 3944.

GAMER COMPUTERS, 71 East Street, Brighton BN1 1HQ. Tel: Brighton (0723) 728681. VELOBYTE COMPUTERS, Schiedamsedijk 5A-6A, 3011 EB Rotterdam, Netherlands. Tel: Rotterdam, Holland (10) 4138197. MICRO BRIDGE, 75 Goodramgate, York YO1 2LS. Tel: York (0904) 455300.

MAIL ORDER ONLY

COMPUTER CUPBOARD, 53 Brunswick Road, Ealing, London W15 1AQ.

21ST SOFTWARE, 15 Bridgefield Avenue, Wilmslow, Cheshire SK9 2JS. Tel: Wilmslow (0625) 528885.





SEND FOR THEM TODAY DEALER ENQUIRIES WELCOME. TEL: 0634 52303 (2 lines)

All prices include VAT P&P UK Mainland only

Total £

in association with

TELECOM GOLD

Help for the Boat People

MICROLINK is being used to bring hope to thousands of distressed Vietnam refugees living in the UK.

Their plight largely ignored, these former Boat People have become a forgotten multitude of havenots crowded into substandard dwellings.

Their families are dispersed and they are unable to find work or obtain help from social agencies because of language difficulties and their ignorance of "the system".

But now MicroLink's telex and electronic mail services are easing cases of hardship by speeding the reunification of families and smoothing their path into Western society.

Many former Boat People are suffering because when they arrived in Britain the authorities assumed that being Vietnam refugees they were automatically Vietnamese.

In fact three-quarters of them were ethnically Chinese, speaking only a form of Cantonese and unable to understand the Vietnamese instructors hired to teach them English.

As a result they were classed as incapable and illiterate and many suffered severe psychological problems as a result of their failure to adapt to British society.

Because of their inability to communicate they could not even obtain adequate help from social agencies and hundreds ended up in squats and dingy hostels.

Shunned by the ethnic Vietnamese, and even UK Chinese communities,

because they were considered inferior, the former Boat People faced a bleak future.

But a Chinese Vietnamese Advice Centre staffed by voluntary social workers has been opened in London to help them, and it is using MicroLink in its efforts.

Alf Jackson, one of the volunteers, said: "Micro-Link's facilities will enable us to establish better communications with refugee agencies all over the world – particularly Hong Kong – and put dispersed families in touch.

"As well as the reunification of families, our work is concerned with improved housing for the refugees and their integration into UK society, for instance helping them set up in business".

CLIFF IS STILL TOPS

DESPITE what some critics might say the top show in London is the Cliff Richard musical Time.

At least that's the verdict of MicroLink subscribers according to the volume of bookings placed through TheatreLink, which is operated in association with renowned theatrical agency Edwards & Edwards.

Although Time has been panned by some of the critics it beats the long-running hit musical Cats into second place in the MicroLink theatre-goers' Top Ten.

In third place comes Me And My Girl – another of the eight musicals in the popularity list – followed by 42nd Street, with Starlight Express in fifth place.

Another target for the critics, Mutiny!, comes sixth followed by perennial favourite thriller The Mousetrap and the comedy hit Run For Your Wife.

Here's YOUR chance to join MicroLink

All you need to use MicroLink is a computer, modem, appropriate communications software and a telephone. Fill in this coupon below for details on how to join:

Please send me an application form to join MicroLink.

My modem is

I do not have a modem.

☐ Please send details.

Name

Address

POST TO: MicroLink, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

Commonwealth link?

MICROLINK has been chosen as a potential medium of communication between the Commonwealth Secretariat in London and the organisation's 49 member countries.

A project is underway to assess various electronic mail and telex options in conjunction with the Secretariat's planned expansion of its computer facilities.

The aim is to improve the speed and efficiency of links between member countries and also with international bodies like the United Nations' agencies and the World Bank.

The Commonwealth's own specialist databases will also be set up as part of the project which is expected to be completed in about two years time.

"MicroLink is one of two systems we are experimenting with at the present time", said Commonwealth Secretariat computer manager Peter Windle. "We have been impressed by its user-friendliness and ease of use".

<u>DMP 2000</u>

Just the ticket for your Electron, and the price is right



Product: Amstrad DMP2000 Price: £159.95 Supplier: Amstrad, 169 Kings Road, Brentwood, Essex CM14 4EF. Tel: 0277 230222

THE Amstrad DMP2000 is a neat front-loading printer in matt black plastic, with a removable smoked plastic cover.

On the right hand side of the sloping fascia is a column of three buttons, On Line, Form Feed and Line Feed.

There are also three indicator lights, for On Line, Paper Out and Power On.

When the printer is switched on there is a brief pause while the printer head sets itself up, then the On Line light comes on indicating that it is ready to receive from the computer.

Other controls include a paper depth indicator and the Friction/Tractor feed switch.

The accompanying manual is very clear on setting-up

By DAVE BERTENSHAW

procedures, and I met no difficulty in preparing it for use.

The ribbon is easy to fit and you don't get your hands covered in ink doing it, either.

Replacement ribbons appear easily obtainable and cost £5.70.

Paper is easy to load. It is fed in from the front and kept flat, an arrangement I like, especially with sheet paper.

To connect it up to the Electron you will need both an interface such as the Plus One, and a Centronics lead as well as the one supplied with the printer does not fit the Plus One.

After a problem-free assembly came the big moment, my first words in print.

This was surprisingly easy after all the horror stories you hear about printer manuals written in Japanese English for obscure Basics.

The DMP2000 was designed for use with non-Amstrad computers, and each instruction is repeated four times, in Amstrad, Commodore, Microsoft and (most important of all) BBC Basic.

Also the English is the sort the Queen would recognise.

A simple matter of VDU2 to send information to the printer, PRINT"HELLO", and there it was, in black and white, my first masterpiece.

The DMP2000 comes equipped with six typefaces: Standard (or Pica), Mini (or Elite), proportional, condensed, near letter quality (NLQ) and NLQ proportional.

To these can be added a variety of options — double-strike, subscript, superscript, bold and italic, although not every option can be used with every typeface. For instance,

NLQ cannot be used with italic.

However, every option can be used with doublewidth and/or underline.

Choosing the typeface option is done via control codes and is, as far as I can tell, completely Epson-compatible (which means that the printer can be used with a variety of commercial software using the Epson standard).

So to choose the doublewidth option you would use VDU2,1,27,1,ASC("W"),1,1.

This may look complicated but you soon get the hang of it, and the manual gives plenty of help.

My wife teaches French and German, so one feature we have found very useful is the ability to use foreign character sets.

This can be done either by using the control codes or by altering the DIP switches. These tiny switches are recessed into the back of the printer and can be set to choose the power-up state of the printer.

They can be used to select various functions so that you don't have to be constantly using the control codes.

By setting these switches – again clearly explained in the manual – then switching on the printer, you can change the character set to one of nine. This means that you can print French with acute accents, German with umlauts and so

The drawback is that these new letters occupy Ascii codes

This is STANDARD typeface, which can be made bold or italic or even bold italic doublewidth underlined

subseript and superseript.

What about condensed italics, or doublestrike?
You can have MINI or PROPORTIONAL

and for those important letters Near-Letter-Quality (NLQ) or, to crown it all, NLQ PROPORTIONAL!

There are more than 100 different print options

Mon père, mon postillon a été frappé par un éclair à Alençon.

Das schöne Fräulein ißt viele Käse in der Küche.

And the script can be French or German or . . .

HARDWARE REVIEW

From Page 27

normally used by other symbols, such as the curly bracket. You therefore have to get used to typing words like tr\u00e4s, but this is easily learnt.

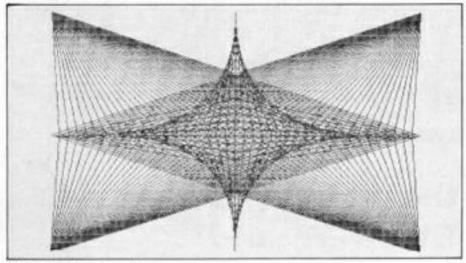
Obviously, the difficulty is only apparent on the screen – the printer spews out perfect French.

One anomaly is that there is no symbol for the circumflex accent. This could prove to be a nuisance.

Only you can decide whether a circumflex accent is worth the extra cost of buying a printer with the full international character set.

There are various graphics options, including single, double and quadruple density modes.

Needing a screen dump I called upon my vast reserves of programming experience. That is I looked through my back issues of *Electron User* until I found Roland Waddilove's article "What a



A Mode 1 screen dump

dump!" (March 1985).

The machine code version of this works perfectly without alteration.

I have only two slight moans about the DMP2000. The first is that there is no tear-off arrangement for tractor paper, which is annoying.

The second is not really Amstrad's fault at all. I use View as my word processor and the big flaw in that, as reviewers have pointed out, is that none of the printer's effects is available unless you buy the View Printer Driver.

The version I have seems to be out of date, because while it works well with underline, bold, doublewidth and sub/ superscript, there is no way of accessing the other facilities from within View. Fortunately the driver listed in this month's issue can cope.

You can set NLQ, condensed and bold using the DIP switches, but this is unnecessarily complicated.

The DMP2000 has many more features than can be included in this review. Suffice it to say that through the control codes you have access to a wide range of options as to page length, vertical and horizontal TAB settings and paper feed rates and direction.

As you have probably guessed by now, I am very impressed with the DMP2000. The print quality is very good (NLQ is excellent), the workmanship of the printer is without fault and above all the price is very interesting indeed.

All these qualities set me back under £160, at least £60 less than the Epson LX80 reviewed in the February 1986 issue of *Electron User* and I didn't pay extra for the tractor feed.

All things considered, Amstrad are to be congratulated on producing the right features at the right price.

ADVENTUROUS PEOPLE LOVE ROBICO

ROBICO SOFTWARE, 3 FAIRLAND CLOSE, LLANTRISANT, MID GLAM. Tel. (0443) 227354

"We turn dreams into reality!"

MYTHS abound in the world of computers and education. Many parents helped to fuel the computer boom a year or two ago acting on the belief that any teenager who sat at a computer became a programmer.

The sky was the limit for these people. At the very least, a good job was a certainty and large numbers of youngsters could earn £50,000 a year by the time they were 16.

In fact, of course, the number of highly paid whiz kids was very limited and, sadly, unemployment has continued to rise.

Even so, all sorts of parents still felt that the ability to use, and in particular program, a home micro is a passport to a successful career.

The baffling thing for such parents was that schools did not seem to have got the message.

In secondary schools programming, if taught at all, was reserved for a small number of 15 and 16-year-old boys. For the younger boys and all girls, computers were mere tools using pre-written programs.

If so many parents thought and still think that programming skills are important, why is it that schools ignore them?

There are a number of reasons, but perhaps most important is that there are many different languages.

Basic (Beginners All Purpose Symbolic Instruction Code), is just one language, and in terms of the real world it is of minor importance.

Even Basic appears in dozens of different versions. These are usually called dialects and different computer designers seem to have their pet versions.

Schools can't really cope with the problem of different languages and dialects.

For instance, the Electron and Spectrum have different dialects and a program written in Basic for one machine has only a limited chance of running on the other.

So a school working in Electron (BBC) Basic would give only limited value to Spectrum owners, and no value at all to industry and commerce.

In practice suitable people can be trained quickly in a particular language, which

Overcome language barriers

might be Fortran, Cobol, Pascal and so on as and when needed.

Despite this many teachers and educationalists think that programming has value and may do some teaching of the required processes as a club activity. All sorts of skills can be enhanced by getting to grips with the micro.

One of the present fashions in education is problem solving. Put crudely, a teacher might give the pupils a task such as making a bridge out of straws. The materials available would be specified and pupils will attempt the task and learn from successes and failures.

Programming a computer can be a problem solving exercise. The task could range from writing your name all over the screen to producing an arcade adventure of the quality of Citadel. No matter

what the problem, solving it can be a valuable learning activity.

One of the skills gained is the ability to use the computer language, but perhaps more important is the ability to specify and analyse a situation, consider various solutions and select the best.

It's not all that different from coping with life, is it?

One of the main reasons that people choose the Electron is because it has a good version of Basic and is fairly easy to program.

(The adverts always stress that by getting an Electron you're getting the same version of Basic that most school computers use.)

Most children find programming hard though, even on the amazing Electron.

The chief difficulty that would-be young programmers

have a problem they wish to solve. Sometimes tied up with this is the thought that "Any program I write will be boring".

Almost as an afterthought comes the second area of

encounter is "What should I

program?" Often they do not

Almost as an afterthought comes the second area of concern. This applies to virtually any piece of complex equipment, be it computer, printer or household appliance – the instructions in the user guide are incomprehensible.

A helpful adult can earn his or her keep in overcoming the first problem.

Such an adult needs to be able to create an unlimited supply of challenges to be solved and dole out encouragement, congratulations and constructive criticisms.

Let's look first at creating programming tasks. There's no point trying to get a child to program at home if the idea does not appeal.

The majority of youngsters are happy to generate graphic displays. Most people seem to think that graphics are difficult, but in fact it's easy to draw using BBC Basic.

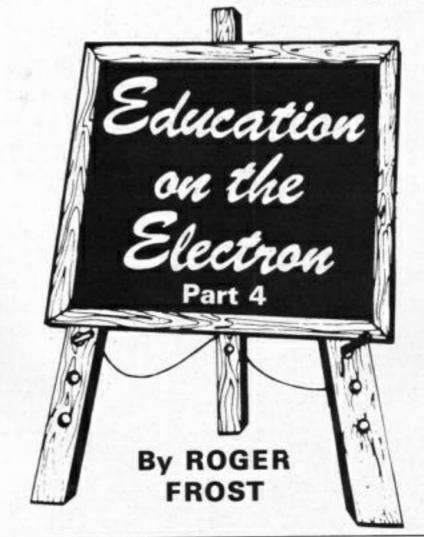
Children at school learn about graph paper and coordinates from very early ages. The two keywords MOVE and DRAW, along with the idea that the screen is a grid, can get youngsters started.

A task such as drawing your own house will not prove beyond most secondary children and it will soon have them seeking for more information such as "How do I change colours?" or "Can I fill in whole areas".

It's possible that some children will realise that drawing four identical windows, all with separate code, is absurd. Such a child now has the need for subroutines or procedures within programs.

So from a simple idea a youngster can develop in his or her own way and can also learn that the first idea he or she thought of is not necessarily the best solution.

A difficulty about graphic programming is that some younger children can't cope with the large numbers. The screen grid of 1280 by 1024 has over a million locations to



From Page 29

keep track of.

I have found that a scaled screen can make life a lot easier. Addcomm, from Vine Micros, has a scale command which allows you to redefine the screen grid in any way you care to.

A 10 by 10 grid is simple enough for juniors and some infants though it wouldn't satisfy the more meticulous, older child who wants accuracy.

Another way of helping younger children is to write a set of graphic procedures circle, square, triangle and so on - which can be called up easily. You do the main coding, leaving the child to solve the problems.

When it comes to encouragement and criticism, don't expect your child to produce perfection. Try to encourage them to improve screen layouts.

You don't need to be a programmer yourself to offer artistic advice. For instance, programs with text in should not have a word split between two lines. Gently persuade youngsters that they can get it right and they will.

The second area of concern for the programmer is the quality of the user guide. There is no escaping that learning Basic can be a bit of a graft.

The problem solving approach to programming means that new ideas and keywords are discovered only when they are required.

There seems very little point in ploughing through a book and learning-about keywords that are virtually never used.

The Basic word ATN is a good example. No doubt it has some uses, but the vast majority of learner programmers will just be confused by the user guide's nearly incomprehensible definition.

What is really needed is an easy-to-read, well organised and coherent book of Basic. For the under elevens, I would

suggest something from the Usborne range.

These books are cheap and cheerful and make a real attempt to make a complex subject simple. Each book may have a specific purpose, such as writing adventure programs or logic games.

They are not Electron books though, being written to cover some of the lesser computers as well.

This means that some of the demonstration programs do not make the best use of the Electron's facilities.

At the next level, a very readable guide is Getting Started in BBC Basic by Mike Bibby, available from Database Publications.

This tutorial-style book starts at the very beginning and could lead an enthusiastic teenager up to a good standard of programming.

An extremely good method of discovering how to code Basic is to look at the listings of programs which do something similar to what is required.

This can point a youngster to particular keywords which might be useful and further research can be done on those words.

Learning Basic then, is not essential for life in the 1980s. but as a problem solving exercise it can have numerous benefits.

It may not actually help children with school work, but hopefully they will learn that with a bit of effort in planning and research difficulties can be overcome.

Almost as an afterthought comes the fact that programming can be immense fun and very satisfying.

One final comment. Programming is actually alive and flourishing in primary schools. Basic is not used, because for all manner of reasons Logo is preferred.

We'll look at Logo on another occasion, but next month will feature an educational use for spreadsheets that could also save you some money too.

QUAL-SOFT

THOUGHTWARE

Sports simulations

"MEXICO '86 is an excellent simulation that will challenge all budding managers"."



NOVA (Nova rating: "You should immediately rush out and buy it").

Value for Money 5 5 5 5

TAPE 1 QUALIFIERS

MEXICO '86*

GAMER **JUNE 1986**

COMPUTER

TAPE 2 FINALS

A WORLD CUP MANAGEMENT SIMULATION

Summer 1984 and English International football is at its lowest ebb. We have failed to qualify for the European Nations Cup, and had a string of very poor International results. In a few months we will set out on the '86 World Cup qualifying trail. You have been given the most important job of restoring English pride in their football. You have a match in Paris, the USSR at Wembley, and a South American tour, to assemble a team, first to qualify, and then to beat the world's best in Mexico.

TAPE 1 (Qualifiers)

- ★ Current squad of 16 players + 20 user defined players.
- Friendlies in Paris, at Wembley + South American tour.
- ANY team formation you choose. 2 from 5 substitutes. In match tactics: any no. of individual player adjustments.
- ★ Your qualification group: full results and table.

TAPE 2 (Finals)

- ★ Choose a 20 man squad to take to the finals.
- Group of 4 prelims. 16 to final knockout comp.
- Extra Time. PENALTY SHOOT-OUTS, where relevant.
- Formation and strength information on opposition.
- ★ 2 from 9 substitutes (the FA tells us so).

THE ONLY ELECTRON SOCCER MANAGEMENT SIMULATION WITH SOUND AND GRAPHICS

QUAL-SOFT comments: With 5 levels of play, 12 depths of sophistication, and "fun" graphics, this game can be enjoyed by an 8 year old youngster as a "fun" game, and by the most sophisticated as a tactical/strategy challenge of the highest order.

PACKAGE: Tape 1 plus Tape 2 plus 20 Page Manual in "Video Cassette" style pack. Only £9.95 (57K RAM usage. Some would call this a MEGAGAME.) YES IT WILL RUN ON YOUR 32k ELECTRON. QUALSOFT GUARANTEE: Sent by 1ST CLASS POST on day the order with P.O., Cheque, Access payment is received. Telephone Access orders accepted.

The use of the name MEXICO '86 does not imply any association with FIFA

QUAL-SOFT, Dept. EU 18 Hazelmere Rd., Stevenage, Herts SG2 8RX.

Tel: 0438 721936

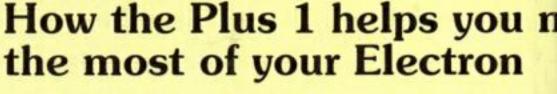
Please supply: MEXICO '86 Electron BBC'B'

Name: . Access No. (if applicable) Never before have there been such money-saving offers for readers of a computer magazine!

EXPAND your Electron

... for much, much less than the price you'd normally pa





With the Plus 1, you and your Electron enter a whole new computing dimension. The Plus 1 turns your Electron into a fully fledged micro capable of using printers, joysticks and cartridge ROMs – the software that comes on a chip. In addition, the Plus 1's analogue to digital port gives access to the outside world – while the slots for the ROM cartridges allow the Electron to take advantage of the latest, most exciting hardware developments yet to be released.

If you want to use your Electron to the full, then it's essential you get a Plus 1.

Normal p

Speci for rea Electr

£3

Inc. FI

EXPAND - with the Electron Word

Convert your Electron into a sophisticated word process packed combination. The package consists of the versal together with View, Acorn's custom designed word process cartridge and the many powerful capabilities of View become Whether you're writing a simple letter or your first novel – you the Plus 1 make an unbeatable combination.

Normal price £82.80

Electron User

EXPAND - with the Electron We

Now you can transform your Electron into a serious mid-Workstation. This package consists of a Plus 1 and to wordprocessor and Viewsheet sarradsheet both on car Workstation makes the Electron a hard-working yet inexper and office. From business letters to a set of invoices, from h cash flow crises, it can take them all in its stride.

Normal price £119.80

Electron User

All prices include VAT and carriage. All offers subject to availability.

Please use the order form o



nake

orice £59.90

al price aders of on User

9.95

REE game cartridge

Processor!

sor with this value le Plus 1 interface, sor. Just plug in the e instantly available. you'll find View and

r price £49.95

rkstation!

with the Electron acclaimed View tridge ROMs. The nsive tool for home nome economics to

r price £59.95

n Page 53

EXPAND - with the under-£100 Plus 3!

The Plus 3 expansion unit provides you with a disc drive and disc interface in one compact unit. It consists of a single sided 80 track drive and ADES, and can store up to 320k of data on each 3½in disc with no limit to the number of tiles. Expansion ports at the rear of the unit enable a Plus 1 to be added and a second drive can be attached which can be either 5½in or 3½in, 40 or 80 track.

The Plus 3 comes complete with a Welcome disc packed full of games, demonstrations, utilities and help files, plus a 111 page manual containing everything you need to get you started right away.

Normal price £219.00

Electron User price £99.95

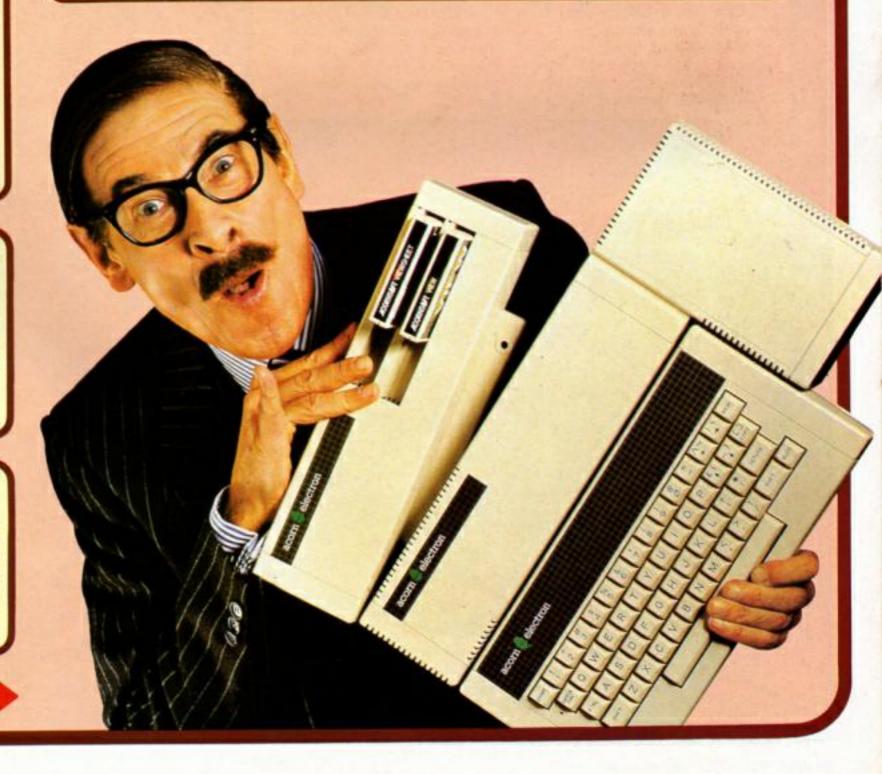
... or a Plus 3 PLUS Database!

Bring the speed of discs and the organised memory of a powerful database to your Electron with the Electron Database combined with the Plus 3 disc drive, this dynamic duo should provide the answer to all your dataprocessing needs.

The database has all the facilities any normal user home or business, would need. Yet – thanks to its menu-driven structure—it is simplicity itself to use. Records can be as varied as you require: You can have up to 32 fields ranging from 2 to over 200 characters in size. Once you've entered the records, information can be recovered with the minimum of fuss, sorting and searching over any number of fields. And when you've created your record structure you're not stuck with it: Field sizes can be changed at will. So, if your interested in keeping records, do yourself a favour: Upgrade to the Electron Database and let your micro do the work.

Normal price £248.95

Electron User price £114.95



WORN OUT with wordprocessing?

DEPRESSED with databases?

OPPRESSED with machine code?

Then you need

It's the perfect antidote to microcomputer malaise!





These two cassettes are not only crammed with 18 of the best games from the early days of Electron User. At no extra expense, we've included on each an unpublished Roland Waddilove machine code masterpiece as a freebie. Roland's Jam Butty and Atom Smash are arcade action at its fastest and most frustrating. And they're only available with Ten of the Best. So give yourself a treat . . . with the most popular cassettes we've ever produced.

Volume 1 contains:

Jam Butty

Machine code simulation of high drama on a building site

Play a round by yourself, or play against your pals.

Haunted House

Fight against all the odds to get out alive.

Space Hike

Another classic. Help the spacemen avoid maurading monsters.

Help Parky through an invisible maze, racing against time.

All the thrills of high-speed driving, with none of the risks.

Alphaswap

Your letters are in a twist. Can you put them in order?

Knockout

Fast and furious action as you batter down a brick wall.

Money Maze

Avoid ghosts and collect coins in an all-action arcade classic.

Lunar Lander

The traditional computer game specially written for the Electron.

Volume 2 contains:

Atom Smash

Machine code thrills as you help to save the world from destruction. Bunny Blitz

Go egg collecting, but keep away from the proliferating rabbits. Castles of Sand

Build castles - but beware the rising tide and hungry sandworms. Reaction Timer

Test your reactions with this traffic lights simulation.

The Electron version of the age-old game of logic and patience.

Jump for your life in this exciting arcade action game.

Test your wits and reflexes in this popular classic ball game.

Code Breaker

Crack the code in a colourful if frustrating brainteaser.

Parachute

Save the plunging sky divers from a watery end.

Star Fighter

Attack the bandit ships in this fast-moving 3D punch-up.

TO ORDER, PLEASE USE THE FORM ON PAGE 53

TEXTED is a simple text editor which will enable you to write short letters, documents and articles on your Electron and print them out using a suitable printer.

It's simple, easy to use and ideal for quick notes.

Although not a full blown word processor, it does have some useful features and you should find it adequate for fairly straightforward tasks.

There's about 11k of memory free and all text is printed out with word wrap. (Word wrap means that it won't split a word over two lines, it takes it down to the start of the next).

When you run TextEd, after a short pause you'll see a menu with a list of nine options to choose from.

The first option is to enter edit mode to input text. The editor is always in overwrite mode, so whatever you type in overwrites any text already on the screen.

This is not a WYSIWYG (What You See Is What You Get) type of word processor. The screen may look very untidy at times but the print routine sorts everything out, adding tabs, carriage returns and word wrap.

This isn't unusual by any means – Mini Office does the same – and you'll soon get used to it.

The cursor can be moved anywhere on the screen using the cursor keys and then text is entered. When the cursor hits the bottom of the screen using cursor down, the screen will scroll up so you can enter more text.

You can get back to the start of the text by holding down cursor up. When the cursor hits the top the screen will scroll down.

The line number of the bit of text at the top of the screen is printed in the top left corner so you can see where you are in the document or letter.

The Return key takes the

Line:000 Line Lexted is a simple text editor which will enable you to write short letters, documents and articles on your Electron and print them out using a suitable printer. It's simple, easy to use and ideal for quick notes. A lt's not a full blown word processor but it does have some useful features and you should find it adequate for fairly straight for ward tasks. There's about 11k of memory free and all text is printed out with word wrap. (Word wrap means that it won't split a word over two lines, it takes it down to the start of the next). A when you run TextEd, after a short pause you'll see a menu with a list of nine options. I'll go through these

TextEd

ROLAND WADDILOVE offers a useful text editor that will convert your computer into a versatile electronic typewriter

cursor to the start of the next line and Delete backspaces and deletes as normal.

To start a new line or paragraph you enter a carriage return by pressing function 0 it looks like a bent arrow on screen.

Note that this does not start a new line on the screen, it only comes into effect when you print the text. There's no need to move to the start of a new line on the screen.

Carry on typing straight after the carriage return.

Function 1 enters a Tab character which is equivalent to inserting five spaces. It looks like a right arrow on screen and is useful at the start of new paragraphs.

If you forget something and want to insert a word in the middle of the text press function 2. This inserts spaces at the cursor position shuffling

text along which you can then overwite as normal.

To remove text without inserting spaces press function 3.

To return to the main menu from edit mode press Escape.

Option 2 is to print the text. Always set up the printer before running TextEd as you can't alter the style halfway through a document. You can set NLQ mode or double space or whatever you want, then load and run TextEd.

First you'll be asked for the line length. This is how wide the text is when printed.

Next, input the width of the left margin. It's up to you to make sure that the printer can cope with the figures.

Entering a line length of 80 and margin of 10 when the printer can only print 60 columns will not produce neatly formatted text. Press

any key to abort printing.

Option 3 is to load a text file. Remember that any text currently in the memory will be lost. If you don't enter a filename TextEd assumes that you don't want to load anything, so it won't erase the old text. It's an escape route in case you select this option by mistake.

Option 4 is to save the text, and option 5 clears all the text so you can start afresh.

Options 6 and 7 allow you to select tape or disc to load or save a file. If you haven't got discs nothing will happen.

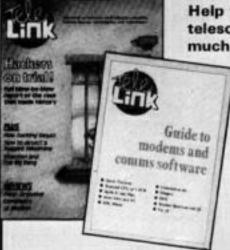
Option 8 will catalog the tape or disc depending which has been selected. If it's tape you'll need to press Escape when you've finished.

Option 9 exits from TextEd and returns you to Basic. Your Now's the time to link your Electron to the big wide world



Join the communications revolution and use your Micro (plus the telephone) to roam the world ... logging on to Prestel, Micronet, MicroLink, Telecom Gold and the

> ever-growing number of bulletin boards, both in the UK and USA. Help yourself to hundreds of free telesoftware programs - and much, much more!



You'll be able to read all about it in Britain's No. 1 communications magazine TeleLink. And with the latest (May/June) issue there's a free supplement that gives a guide to all the modems and comms software now available for the BBC Micro and Electron.

 Here's a special offer for readers of Electron User. For every subscription ordered using the form below, we will give you your first quarter's subscription to Micronet - worth £10 - absolutely free of charge.

If you would like to take advantage of this offer, don't forget to tick the box!

ORDER FORM

| LIV B | 1 1 | Overes | 101 | |
|----------|--|--|--|--|
| Eire | Europe | Airmail | (1) | £p |
| £1.50 | £2 | £2.50 | 5014 | |
| £15 | 623 | £38 | ☐ 5001 . | 115 |
| t, worth | £10. | hs' | 5019 | FREE |
| | | £10.95 | ☐ 5017 · | CEC-5 |
| | سب | | d∕isa [⊔ ⊔ ⊔ | 1 |
| | Signed | | None: | |
| Vertex | | | | |
| | | | | |
| | £1.50 £15 d like a front, worth is cribe to To | Eire Europe £1.50 £2 £15 £23 d like a free 3 mont of, worth £10. cribe to TeleLinki £3.95 £6.95 ote method () charge/Eurocard/Book de payable to Dat | Eire Europe Airmail £1.50 £2 £2.50 £15 £23 £38 d like a free 3 months* c, worth £10. cribe to TeleLink) £3.95 £6.95 £10.95 the method () charge/Eurocard/Barclaycar | Eire Europe Airmail (J) £1.50 £2 £2.50 □ 5014 □ £15 £23 £38 □ 5001 □ d like a free 3 months' c, worth £10. cribe to TeleLink) £3.95 £6.95 £10.95 □ 5017 □ the method (J) charge/Eurocard/Barclaycard/Visa de payable to Database Publications Ltd. |

| Order at | any | time | of | the | day | or | night |
|----------|-----|------|----|-----|-----|----|-------|
|----------|-----|------|----|-----|-----|----|-------|

| Tele | phone | Orders: |
|------|-------|---------|
| 06 | 1-429 | 7931 |

Orders by Prestel: Key *89, then 614568383 MicroLink/Telecom Gold 72:MAG001

Don't forget to give your name, address and credit card number

EU8

ELECTRON TEXT ADVENTURES

HOLL-SOFT

Introducing our new range of adventures for the Electron

THE DRUIDS CIRCLE

Solve the mystery of the stones and the Druids secret to return safely to your own time.

Price £3.50

MISSION XP2

Helplessly drifting in orbit around an alien planet you must find a way to return to earth and escape the marauding pirates.

Price £3.50

TOMB OF DEATH

Can you survive the deadly maze and recover the lost golden idol of Haras?

Price £3.50

PONY EXPRESS

Battle your way through bandits and hostile Indians to Fort North in this Wild West adventure.

Price £3.50

All adventures with save game facility for the Electron or BBC B. Price £3.50 or £9.00 for 3, or the special price of £11.50 for 4. Please add 50p postage and packing per order. Also hint sheets available 30p each game. Please add £1.00 for all orders outside UK.

Send cheque or postal order with your order to:

HOLL-SOFT

79 Hinde House Lane, Sheffield S48GZ

ELECTRON SOFTWARE BARGAINS from POTTER PROGRAMS 'THE HOTTER PROGRAMS'

Send a S.A.E. for our full list of cut-price software for the Electron, which includes the Big value Computer Hits 10 and Computer Hits 10 Vol 2 from Beaujolly, as seen on T.V. for our fully inclusive price of only £7.50 each.

All our games are original and in stock at time of advertising, so order today and avoid delay. Orders outside the UK please add £1.00 per tape.

Also available direct from Potter Programs our fiendish adventure games.

* NEW RELEASE - THE TWIN ORBS OF AALINOR

One hundred per cent machine code and data compression and interactive characters. Can you recover the lost Orbs of Aalinor and harness their potent power?

NOT AVAILABLE AS PART OF OUR SPECIAL OFFER

Price: £3.95 + 50p p&p

* NEW RELEASE - RETURN OF FLINT 32K The sequel to the very popular SUPER AGENT FLINT. As the Super Agent you have successfully docked your captured rocket with the British Space Station, only to find that it has been infiltrated by the dastardly T.E.R.D. organisation. This is where your mission begins. Price: £2.95

THE STAFF OF LAW 32K

Can you track down the Staff of Law and master its potent Earth Power to defeat the Despiser? "Extremely fiendish . . . well worth buying" Electron User. Price

SUPER AGENT FLINT 32K

The dreaded T.E.R.D. (Terrorist for England's Ruin and Destruction) organisation has reared its ugly head. Only you as Super Agent Flint can capture their interstellar rocket and secret plans. "Quite fest and fun to play , at the price I must recommend it

GALADRIEL IN DISTRESS 32K

The Princess Galadriel has been abducted and an evil spell holds her prisoner. You must seek aid from the Wise Lore Master to release her and save yourself from the wrath of King Theoden. Price £2.95

All adventures with full save game facility for the Electron or BBC B. Price £2.95 each OR SPECIAL OFFER: Any three games for £5.95 OR ALL FOUR games for only £7.95. Please add 50p P&P per order (£1.00 for orders outside UK). Also hint sheets available 20p each game.

Send cheque or P.O. with your order to:

Dept E15, Potter Programs, 7 Warren Close, Sandhurst, Camberley, Surrey GU17 8JR. Tel: 0252 877608.

From Page 35

text is still in the memory, stored above HIMEM though, so if you're in the middle of a document and want to know what 27 x 56 is you can leave TextEd, type in the calculation, enter RUN and carry on where you left off.

A word of caution – anything which alters HIMEM will destroy the text.

TextEd is written almost entirely in machine code, so be careful when entering it. Unless you're an experienced Electron user I would suggest getting the monthly tape, as finding typing errors in an assembly listing isn't easy.

If you do decide to have a go at typing it in save it before running as it deletes all the assembly listing, leaving just a few lines of Basic.

It should be quite easy to add extra features such as merge two files, search and replace, or even a spelling checker. I'll leave that up to you though. ***** T E X T E D *****

- 1. Edit the text.
- 2. Print the text.
- 3. Load new text file.
- 4. Save current text.
- 5. Clear all text.
- 6. Select tape filing system.
- 7. Select disc filing system.
- 8. Catalog disc/tape.
- 9. Exit from TextEd.

Press a key

TextEd is a simple text editor which will enable you to write short letters, documents and articles on your Electron and print them out using a suitable printer. It's simple, easy to use and ideal for quick notes.

It's not a full blown word processor but it does have some useful features and you should find it adequate for fairly straight forward tasks. There's about lik of memory free and all text is printed out with word wrap. (Word wrap means that it won't split a word over two lines, it takes it down to the start of the next).

When you run TextEd, after a short pause you'll see a menu with a list of nine options. I'll go through these

Sample printout using TextEd

Texted listing

10REM **** TextEd ***** 28REM By R.A. Waddilove 30REM (c) Electron User 48REM ************* 50REM +If you renumber+ 6BREM *this program it* 78REM # won't work! # SEREM ************ 98MODE 6: HIMEM=&5888 188PROCassemble: END 1100N ERROR RUN 120PROCinitialise 13BREPEAT 14@PROCmenu 150IF K%=1 PROCedit 160IF K%=2 PROCprint 170IF KX=3 PROCload 188IF KX=4 PROCsave 1981F KX=5 PROCclear 2001F KY=6 THEN +TAPE 2101F KX=7 AND PAGE=&1000 THEN #ADFS 2281F KX=7 AND PAGE(&1088 THEN *DISC 238IF KX=8 THEN OSCLI*FX2 29": OSCLI "CAT": a\$=6ET\$ 248UNTIL KX=9 **250CLS** 26BEND

278 280DEF PROCprint 298PRINT TAB(18,5)**** PR INT TEXT *** TAB (10, 18) "Lin e length ":: INPUT LX:LX=ABS (LX) MOD128 380PRINT TAB(18,18)SPC(48)TAB(18,18) "Margin ":: INPUT MI: MI=ABS (MI) MOD58 319PRINT TAB(18,18)SPC(48)TAB(18,18) "Please wait"; 32811=45FFF: J1=text+48:RE PEAT IX=IX-4:UNTIL !IX(>&28 282828 OR IX<JX: IX=IX+4 338PRINT TAB(18,18) *Press space to print";:*FX21 340IF BET\$(>" " ENDPROC 35@J%=text:a\$="":VDU12,2 368REPEAT 370PRINT SPC(MX): 388REPEAT 3981F ?JX=128 a\$=a\$+CHR\$1 488IF ?JZ=129 a\$=a\$+" 418IF ?JZ(127 a\$=a\$+CHR\$? JZ 428JZ=JZ+1 438UNTIL LEN a\$>L%

448AX=LX 458IF MID\$(a\$,AZ,1)()" " AND AX>2 AX=AX-1:60TO 450 468IF INSTR(a\$,CHR\$13) PR INT LEFT\$(a\$, INSTR(a\$, CHR\$1 3)-1):a\$=MID\$(a\$, INSTR(a\$,C HR\$13)+1) ELSE PRINT LEFT\$(a\$,A%):a\$=MID\$(a\$,A%+1) 478UNTIL JZ>IZ OR INKEY\$8 ()** 48**0**VDU 3 498PRINT "Press a key";: #FX21 588a\$=6ET\$ 510ENDPROC 528 538DEF PROCelear 548PRINTTAB(5,5) "Are you sure you want to TAB(9,7) c lear the text?":: #FX21 550IF INSTR(" Yy", 6ET\$) >1 CALL CI: ptr=text: ?x=8: ?y= 1:?line=0:!top_line=text 568ENDPROC 578 588DEF PROCsave 598PRINTTAB(10,5) **** SAV E TEXT *** TAB(18,18) *Think ing";

68811=45FFF: J1=text+48: RE PEAT IX=IX-4:UNTIL !IX<>428 202020 OR 1%(J%: I%=I%+4 610PRINT TAB(10,18)SPC(15) TAB (10, 10) "Name ";: IMPUT n ame\$:name\$=LEFT\$(name\$,10) 628IF name\$= " ENDPROC 638+FX229 6400SCLI"SAVE "+name\$+" " +STR\$"text+" "+STR\$"IZ 65@ENDPROC 678DEF PROCload 688PRINTTAB (18,5) **** LOA D TEXT **** TAB(18,18) "Name "::INPUT name\$:name\$=LEFT\$(name\$,18) 698IF names=" ENDPROC EL SE CALL CI:!ptr=text:?x=0:? y=1:?line=0:!top_line=text 700*FX229 7180SCLI"LOAD "+name\$+" " +STR\$*text 728ENDPROC 738 748DEF PROCeenu 758+FX229,1

760VDU26,12:PRINTTAB(5,1)

"***** T E X T E D ******

770RESTORE780:FOR IX=1 TO

9:READ a\$:PRINTTAB(5,2+IX*

2);IX;". "a\$".":NEXT

780DATA Edit the text,Pri

nt the text, Load new text f ile, Save current text, Clear all text, Select tape filing g system, Select disc filing system, Catalog disc/tape, E xit from TextEd

798PRINT TAB(18,23) "Press a key";: VDU 23,1,1;8;8;8;: *FX21

888REPEAT KX=6ET-48:UNTIL KX>8 AND KX<18:CLS

818ENDPROC

828

830DEF PROCedit

848VDU 23,1,8;8;8;8; 858COLOUR129:COLOUR8:PRIN TSPC(48)TAB(1,24)* f8=CR f 1=TAB f2=insert f3=remov e ";:COLOUR128:COLOUR1:PRIN TTAB(1,8)*Line:"TAB(31,8)*E

sc=Menu* 868CALL TX

> 878ENDPROC 888

890DEF PROCinitialise

900VDU15

918a\$=STRING\$(255,"+")

070AEV22E 120

928*FX225,128 938IF FX=&12345678 FX=8:F

ORIX=0 TO &400STEP4: IX: &300 0=IX: &5000: NEXT: CALL CX: REM

Move code+clear text 940ptr=&70:x=&72:y=&73:li ne=&74:top_line=&75:text=&3

958!ptr=text:?x=8:?y=1:?l ine=8:!top_line=text

968ENDPROC 978

980DEF PROCassemble

990F%=0: *KEY8 DEL.38,100: MDEL.978,5000: MH.=&3000: MRU

NIM

1000+FX16 1010+FX4,1

1828VDU 19,8,4;8;8;28,18,2

1838PRINT' **** TextEd ***

""Assembling code" 1848VDU 23,128,6,6,38,78,2

54,252,64,32:REM CR

1858VDU 23,129,8,12,6,254, 254,6,12,8:REM TAB

1108osrdch=!&210 AND &FFFF :oswrch=!&20E AND &FFFF:osb vte=!&20A AND &FFFF

1110text=&3401:text_end=&5 FFF:maxline=255

1128ptr=&70:x=&72:y=&73:li ne=&74:top_line=&75:counter =&77

1138temp=478

1140FOR pass=4 TO 6 STEP 2 1150PX=&3000:0X=HIMEM

1168E OPT pass

1178.T% \texted

1188JSR window:LDA #12:JSR oswrch:LDA #26:JSR oswrch

\CLS window

1190JSR line_number

1200JSR print_screen

1220.main_loop

1238LDA #(main_loop-1)DIV2 56:PHA:LDA #(main_loop-1)MO

D256:PHA \return address 1240JSR cursor on

1250JSR osrdch

1268CMP #27:BNE #7:PLA:PLA :LDA #126:JMP osbyte \Escap

1278.a7 CMP #127:BNE a1:JM P delete

1288.m1 CMP #136:BNE m3:JS R cursor_off:JMP xleft

1298.m3 CMP #137:BNE m4:JS R cursor_off:JMP xright

.1388.a4 CMP #138:BNE a5:JM

P cursor_down 1318.a5 CMP #139:BNE a2:JM

P cursor_up 1328.m2 CMP #32:BCC m6:CMP #&82:BCS m6:JMP valid_char

1338. a6 CMP #&@D: BNE a8: JM

P return

in loop

1348.a8 CMP #&82:BNE a9:JM P insert

1358.e9 CMP #483:BNE #18:J

1368.a18 RTS \return to ma

1378\-----

1380.insert

1398LDY y:CPY #23:BNE in1

\bottom line?

1488LDX x:CPX #39:BEQ end_ insert \can't if at 39,23

1418.in1 1428JSR fx21

1438LDA #text_end MOD256:S

TA temp:LDA #text_end DIV25

6:STA temp+1

1448LDY #8 1458.1000

1460SEC:LDA temp:SBC #1:ST

A temp:LDA temp+1:SBC #8:ST A temp+1 \temp=temp-1

1478LDA (temp), Y: INY: STA (

teep),Y:DEY

1488LDA temp: CMP ptr: BNE 1

000

1498LDA temp+1:CMP ptr+1:B

NE loop

1500LDA #32:STA (ptr),Y \

insert space 1518JSR print_line

1528JSR inkey: BCC in1 \ke y held down?

1530.end_insert

1540JMP print_screen 1550\-----

1568.remove \remove space

1578LDY y: CPY #23: BNE rea1

\bottom line? 1588LDX x:CPX #39:BEQ end_

remove \can't if at 39,23 1598.rem1

1618LDA ptr:STA temp:LDA p tr+1:STA temp+1 \temp=ptr

1628LDY #1 1638.loop

1600JSR fx21

1648LDA (temp),Y:DEY:STA (temp),Y:INY \?temp=temp?1

165@CLC:LDA temp:ADC #1:ST A temp:LDA temp+1:ADC #8:ST

A temp+1 \temp=temp+1
166@LDA temp:CMP #text_end
MDD256:BNE loop

1678LDA temp+1:CMP #text_e nd DIV256:BNE loop

1680DEY:LDA #32:STA (temp)
,Y \space at end

1690JSR print_line 1780JSR inkey:BCC real \k

ey held down? 1718.end_remove

1720JMP print_screen

1750LDA #31:JSR oswrch:LDA x:JSR oswrch:LDA y:JSR osw

rch \TAB(x,y)
1768LDA #48:SEC:SBC x:TAX
\number of chars to print

1770LDY #8 1780.100p

1798LDA (ptr),Y:JSR oswrch

1888INY: DEX: BNE loop 1818RTS

of next line

1848JSR cursor_off 1858LDY y:CPY #23:BEQ end

cr

1860.loop 1870JSR xright

1880LDX x: BNE loop \move to start of next line

1890.end_cr 1900RTS

1930JSR oswrch \print cha r...also removes cursor

1948LDY #8:STA (ptr),Y \s

1958JMP xright \x=x+1

1978.delete

1988JSR cursor_off 1998SEC:LDA ptr:SBC #1:STA

temp:LDA ptr+1:SBC #8:STA temp+1 \temp=ptr-1

2000LDY #8:LDA #32:STA (te ap),Y \delete

2010JMP xleft \x=x-1 2020\-----

2030.cursor_off

2848LDY #8:LDA (ptr),Y:JMP

oswrch

2078LDA #17:JSR oswrch:LDA #8:JSR oswrch \COLOUR 8

2000LDA #17:JSR oswrch:LDA #129:JSR oswrch \COLOUR 1

2898LDA #31:JSR oswrch:LDA x:JSR oswrch:LDA y:JSR osw rch \TAB(x.v)

2188LDY #8:LDA (ptr),Y:JSR oswrch \print char under

2118LDA #17:JSR oswrch:LDA #1:JSR oswrch \COLOUR 1 2128LDA #17:JSR oswrch:LDA

#128:JSR oswrch \COLOUR 1

2138LDA #8:JSR oswrch \ba ckspace 2148RTS

2150\-----2160.scroll_down

2178LDA line:BEQ end_scrd:

DEC line

2188JSR window 2198LDA #38: JSR oswrch: LDA #11:JSR oswrch \home+curs or up 2200SEC:LDA top_line:SBC # 48:STA top line:LDA top_lin e+1:SBC #8:STA top_line+1 2218LDA #26:JSR oswrch \ca ncel window 2220.end_scrd 2238RTS 2248\-----2250.scroll_up 2260LDA line: CMP #maxline: BEQ end scru: INC line 227BJSR window 2288LDA #31:JSR oswrch:LDA #8:JSR oswrch:LDA #22:JSR oswrch \TAB(0,23) 2298LDA #18: JSR oswrch \do 2388CLC:LDA top_line:ADC # 48:STA top_line:LDA top_lin e+1:ADC #0:STA top line+1 2318LDA #26:JSR oswrch \ca ncel window 2320.end_scru 2338RTS 2348\-----2350.print screen 2368LDA #31:JSR oswrch:LDA #8: JSR oswrch: LDA #1: JSR o swrch \TAB(8,1) 2378LDA top line: PHA: LDA t op_line+1:PHA \save top_li ne 2388LDA #23:STA counter 2398.ploop 2488LDY #8 2418LDX #48 2428.ploop1 2430LDA (top_line),Y:JSR o swrch 2448 INY: DEX 2450BNE ploop1 246@CLC:LDA top_line:ADC # 48:STA top_line:LDA top_lin e+1:ADC #8:STA top_line+1 2470DEC counter 2480BNE ploop 2498PLA:STA top_line+1:PLA :STA top_line 2500RTS 2518\-----2528.xright \x=x+1 2538LDX x:LDY y 2548INX: CPX #48: BEQ xr1 \ x=48?

2558.xr2

2560STX x 2578CLC:LDA ptr:ADC #1:STA ptr:LDA ptr+1:ADC #8:STA p tr+1 \ptr=ptr+1 2588. end_xr 259@RTS 2688.xr1 \end of line 2610CPY #23: BEQ end xr \c an't if x=39 & y=23 2620INY:STY y 2638LDX #8:BEQ xr2 2648\-----2658.xleft \x=x-1 2660LDX x 2670DEX:BMI x11 \x<8? 2688.xr2 2698STX x 2700SEC:LDA ptr:SBC #1:STA ptr:LDA ptr+1:SBC #8:STA p tr+1 \ptr=ptr-1 2710.end_xl 2728RTS 2738.x11 \x=8 2748LDY y:DEY:BEQ end_xl \can't if at 0,1 275@STY y 2760LDX #39:BNE xr2 2778\-----2780.cursor down 2790JSR cursor_off 2886LDY y:CPY #23:BEB bott on \at screen bottom? 2818INY:STY y \y=y+1 2828CLC:LDA ptr:ADC #48:ST A ptr:LDA ptr+1:ADC #8:STA ptr+1 \ptr=ptr+40 283**8**RTS 2848.bottom 2858LDA line: CMP #maxline: BEQ end cd \at bottom of t ext? 2860JSR scroll up 2870CLC:LDA ptr:ADC #40:ST A ptr:LDA ptr+1:ADC #8:STA ptr+1 \ptr=ptr+48 2888LDA #129:LDX #&D6:LDY #&FF:JSR osbyte:TYA:BNE bot tom \scroll again? 2890.end_cd 2900JSR print_screen 2918JSR fx21 2920JMP line_number 2938\-----2940.cursor_up 2950JSR cursor off 2960LDY y:DEY:BEQ top \at screen top? 2978STY y \y=y-1

2980SEC:LDA ptr:SBC #40:ST

The Return key takes the cursor to the start of the next line and delete backspaces and deletes as normal. J-To start a new line or paragraph in the document you must enter a carriage return by pressing function 0, it looks like a bent arrow on screen. Note that this does not start a new line on the screen, it only comes into effect when you print the text and there's no need to move to the start of a new line on the screen. Carry on typing straight after the carriage return. J-Function 1 enters a Tab character which is equivalent to inserting five spaces. It looks like a right arrow on screen and is useful at the start of new paragraphs. J-Tables 1985.

A ptr:LDA ptr+1:SBC #8:STA ptr+1 \ptr=ptr-48 2998RTS 3000.top 3010LDA line: BEQ end cu \ at top of text? 3828JSR scroll down 3030SEC:LDA ptr:SBC 440:ST A ptr:LDA ptr+1:SBC #8:STA ptr+1 \ptr=ptr-48 3848LDA #129:LDX #&C6:LDY #&FF: JSR osbyte: TYA: BNE top \scroll again? 3858.end_cu 3860JSR print_screen 3878JSR fx21 3888JMP line number 3898\-----3100.line number 3118LDA #31:JSR oswrch:LDA #6:JSR oswrch:LDA #8:JSR o swrch \TAB(5,8) 3120LDA line \get line nu 3138LDX #188:JSR digit 3140LDX #10:JSR digit 3158LDX #1 3160.digit 3178STX temp 3188LDX #47 3198SEC 3200.loop 3218INX 3220SBC temp: BCS loop

3238ADC teep: TAY

3250TYA: RTS

3248TXA: JSR oswrch

3268\-----

3278.fx21 LDA #21:LDX #8:L DY #8: JMP osbyte *FX21 3288.inkey LDA #&81:LDX #1 0:LDY #0:JMP osbyte \INKEY(18) 3290.window LDA #28:JSR os wrch:LDA #8:JSR oswrch:LDA #23:JSR oswrch:LDA #39:JSR oswrch: LDA #1: JMP oswrch \ VDU 28,0,23,39,0 3388/-----3318.CX \clear text 3320LDA #text MOD256:STA t emp:LDA #text DIV256:STA te mp+1 \temp=text start 3338LDY #0:LDA #32 3340.loop 335@STA (temp),Y 336BINC temp: BNE wipe1: INC temp+1 3378.wipe1 3388LDX temp:CPX #(text_en d+1) MOD256: BNE loop 3398LDX temp+1:CPX *(text end+1) DIV256: BNE loop 3488RTS 3418] 342BNEXT 3438FX=&12345678:PRINT'*De leting source 3448+FX21 3450+FX138,0,128 3468ENDPROC

This listing is included in this month's cassette tape offer. See order form on Page 53.

LAST year I spent many an hour writing an arcade adventure called Citadel for the BBC Micro and Electron for Superior Software from my home in Denmark.

Some of the screens have several animated monsters and many complex calculations have to be done.

With the BBC Micro speed is no problem, but I was afraid the Electron version would be too slow.

This is because the Electron has slow RAM and lacks some of the dedicated processors that are found in the BBC Micro.

So it has to compensate by doing the same tasks - like video and keyboard handling in software.

This means that a machine code program runs at half the speed of the BBC Micro in Modes 4 to 6 and is more than four times slower in Modes O to 2.

The only answer was to find ways of speeding up the Electron so that Citadel would be as playable as the BBC Micro version.

If I hadn't discovered the methods outlined below the game would never have been released for the Electron.

To show how easy it is to speed up the Electron enter Program I.

It takes about 6.6 seconds to execute on an unexpanded Electron and 8.9 seconds on one fitted with a Plus 1.

However if a key is pressed while the program is running the time taken is 9.4 seconds and 14.7 seconds respectively.

If you have a Plus 1 fitted

- 18 REM PROGRAM I
- 20 MODE2
- 30 TIME=0
- 48 FOR Y=8 TO 1828 STEP B: MOVE 8, Y: DRAW 1272, Y: NEXT
 - 50 PRINT'TIME
 - 68 +FX15,1

Program I

By MICHAEL JACOBSEN

add the following lines:

22 #FX163,128,1 78 +FX163,128,8

This turns off the analog interface (ADC), and the program runs as fast as on an unexpanded Electron. Now enter:

> 24 #FX178,8,8 80 #FX178,255.8 .

This stops the keyboard interrupt while the program is running and now the time taken is only 6.4 seconds, no matter whether keys are pressed or not.

As you can see if you run a game on an Electron with a Plus 1 which uses the keyboard it is possible to increase the speed by 230 per cent.

If you just want to do calculations or draw a new screen in a game you could add these lines:

260LDMODE=?&282:?&282=&88:? &FE07=&B0 9074282=OLDMODE: 74FE07=OLDM

This turns the screen off and the program only takes 3.1 seconds. Compared with the 14.7 seconds in the worst case, this is an increase in speed of more than 470 per

Note that it is not enough just to poke a value into &FEO7, as the operating system switches back to the old mode stored in ?&282 if sound is used.

As the above example illustrates, a program is slowed down considerably when the keyboard is used.

It is easy to stop the keyboard interrupt using *FX178,0,0. However this means that we can no longer get input from INPUT, GET or INKEY.

This is fine though if the

program is just doing calculations or if a joystick is used.

When the keyboard is disabled the OS is no longer told what is happening to the keyboard. However it is still possible to read the keyboard - you just have to access the hardware directly. This is only possible from machine code.

Program II reads the keyboard directly and tests the keys *, X, /, Z and Return. If you run the program you can move a character around the screen. Now insert the line:

235 *FX178,0,0

to disable the keyboard and the program runs faster, but you can still control the character from the keyboard.

The keyboard is treated as ROM number 8 and any key can be read just by reading a certain bit from this. Each column of four keys on the keyboard share a byte of memory in it.

Table I shows which bit of which byte you must test to read any key. For instance the seventh column consists of the keys 6, Y, H and N.

&BF7F. Bit O of &BF7F tells if 6 is pressed, Bit 1 if Y is pressed and so on. Bits 4 to 7

must first select the keyboard ROM. The current ROM number is stored at &F4 and &FE05, so you must write to these addresses. It can be done like this:

> LDA #8 STA &F4 STA &FE05

If you wish to know if Y is pressed you must read location & BF7F, so we simply use: .

LDA &BF7F

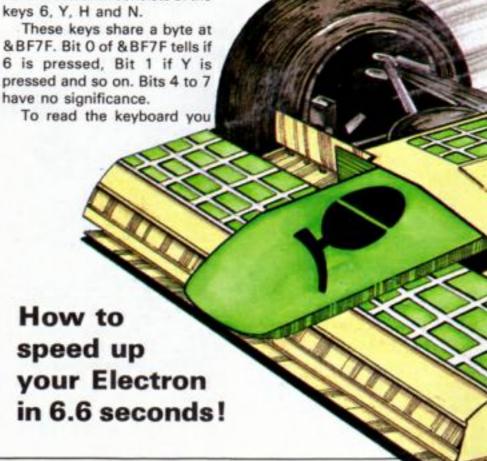
and test if Bit 1 is on:

AND #1

The key Y is pressed if the accumulator is non-zero.

When the keyboard ROM has been selected any key can be tested using just five bytes. This way of testing a key is almost the same as using INKEY (-X) or osbyte & 79, but much faster.

Program II saves memory by creating a table containing the addresses of the keys and a mask table to test the correct bit for each key. The result is



stored in a key table.

If you wish to return to Basic or any other language from machine code you must reselect the old ROM. This is done by poking the old value of &F4 back into &F4 and &FE05.

Note it is not enough just to poke a value into &FE05 as the operating system will take the contents of &F4 and put it into &FE05 when it gets a chance.

If you wish to read a string of keys, for instance to add a name to a highscore table, it is easier to enable the keyboard using *FX178,255,0 and do it the old way.

If you have a Plus 1 the ADC will interrupt your program just like the keyboard does. The ADC can be turned off using *FX163,128,1.

Now what if you wish to read a joystick? Easy, read it directly. To read an ADC channel directly you must poke a value into location &FC70. The value for each channel is:

| Channel | Value |
|---------|-------|
| 1 | 4 |
| 2 | 5 |
| 3 | 6 |
| 4 | 7 |

that channel is ready Bit 6 of &FE72 becomes 0. You could test it like this:

REPEAT: UNTIL (?&FC72 AND&40) = 8

Now the value of that channel can be read as a 1 byte value at &FC70.

X=?&FC78

If you wish the result to be compatible with ADVAL(1-4) multiply the result by 256. The problem about this and the normal method of reading a joystick is that a lot of time is spent waiting for the conversion to finish.

It would be better if we could ask the ADC to read a channel and then do something else while it is converting.

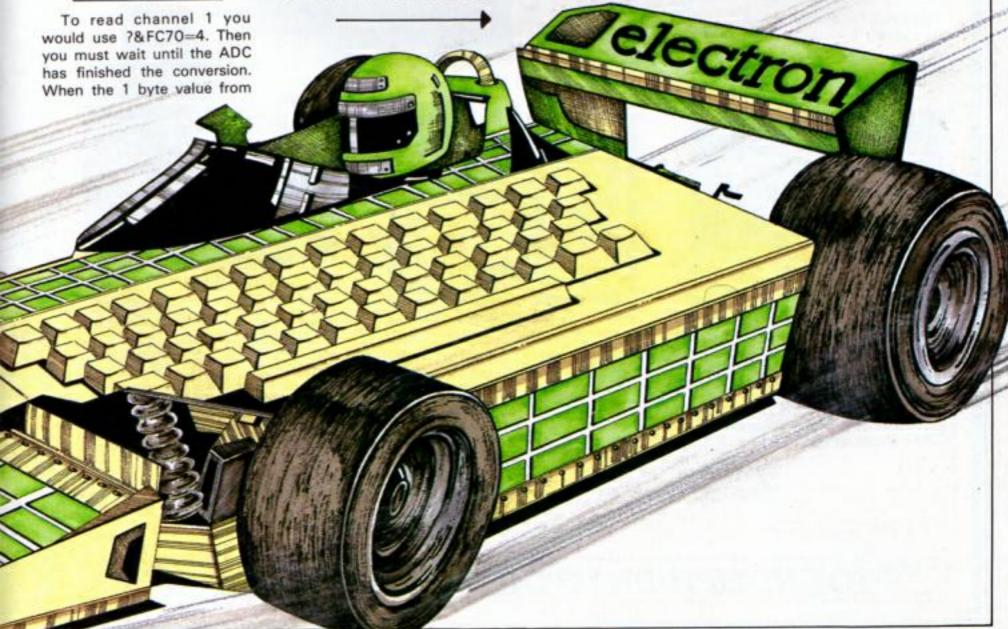
Program III uses an event routine to read channels 1 and 2 without any delay. Once the event is started you can read the X and Y channel just by reading **Jox and **Joy.

You could use the ADC conversion complete event, but I have used the start of vertical sync event as it only interrupts 50 times a second.

This means that Program III reads each channel 25 times a second and this should be sufficient for most purposes.

18 REM PROGRAM II 188 LDX#8:LDY#4 20 REM Direct Electron K 198 . Rkc: LDA (Keyadd, X): AN eyboard Read D Keymask, Y: STA Key, Y 200 DEX: DEX: DEY: BPL Rkc 30 REM Michael Jakobsen 48 REM Enter 235*FX178,8 218 \ Back To Old Rom .e for fast mode 228 LDA Oldrom: STA&F4: ST 50 MODE2 A&FE85 68 Key=&78: Keyadd=&88: Ke 238 RTS:]: NEXT 248 REM Test Keys ymask=&8A: Oldrom=&7A 78 FORX=8TO4: READA.B:?(K 258 X=18: Y=15: C=1 evadd+X+2)=A:?(Kevadd+X+2+1 268 VDU23;8282;8;8;8;)=A DIV&100:Keyeask?X=B:NEX 278 REPEAT 288 CALL Rkb 298 IF Key?8THENY=Y-1: IF 88 REM + 98 DATA&BFFB.4,&B7FF.8,& Y<8THENY=8 388 IF Key?1>8THENX=X+1: BFF7,8 188 REM Z Return IFX>19THENX=19 118 DATA&AFFF, 8, &BFFD, 4 318 IF Key?2>8THENY=Y+1: IFY>30THENY=30 128 FORIX=8TO2STEP2:PX=&C 80: [OPTIX 328 IF Key?3>8THENX=X-1: 138 \ Remember Old Rom IFX (BTHENX=8 148 .Rkb:LDA&F4:STA Oldro 338 IF Key?4>8THENC=C+1: IFC>7THENC=1 158 \ Select KeyBoard Rom 348 COLOUR C:PRINTTAB(X, 168 LDA#8: STA&F4: STA&FE8 Y) *#": 358 UNTIL8 178 \ Read Keys

Program II



Four rip-roaring games for your computer for less than £1.50 per game!

Three of this high-powered collection are top-rate machine-code versions of arcade classics and the fourth is a thrilling real-time adventure game. There's hours of enjoyment and something to suit everyone in this unique value for money collection.



SNAPMAN - Guide your man through the maze as he munches energy pellets and avoids hostile aliens.



MAYDAY - A futuristic adventure! As captain of an interstellar cruiser you must guide the sole survivor of a stricken space freighter through the wreckage of his craft. If you fail to recover those vital medical supplies a whole planet is doomed!





PANZER ASSAULT - You are a tank commander engaged in vicious combat against encircling enemy forces.



ALIEN INTRUDERS - With only your laser for protection you must destroy the waves of aliens who threaten to engulf you.

DNLY £5.9 tape

TO ORDER TURN TO THE FORM ON PAGE 53

The fire-buttons are read as:

Fire1=(?&FC72 AND &18) and

Fire2=(?&FC72 AND &28)

The result is zero if a button is pressed. If you want the result to be non-zero when a button is pressed use:

Fire1=(?&FC72 AND &18)EOR&18

Program III

Make of computer _

together with:

Fire2=(?&FC72 AND &28)EDR&28

Finally if you wish to read the fire-buttons exactly as with ADVAL(0):

Fire=(?&FC72 AND&38)/&18 EOR3

Using the above methods it is possible to make your Electron run 230 per cent faster even with a Plus 1 fitted.

If you think it sounds a bit

confusing just experiment a little. You will see 'it is quite easy to adapt the methods in your own programs.

This is an absolutely free way of getting a Formula 1 Electron.

Finally, the Electron keyboard consists of 14 columns each with four keys. Table I contains the addresses in the keyboard ROM of the 14 columns (0-&D and the keys that can be read at each address.

The addresses have been calculated as Add=&BFFF-2° Column. The first key listed at each address is Bit 0 and the last key is Bit 3.

Note that the keyboard is selected as ROM number 8 or 9, both are equivalent. Basic is ROM number 10 or 11.

| Column | Address | Bit: 0 | 1 | 2 | 3 | |
|--------|----------------|--------|---------|--------|--------|--|
| 0 | &BFFE | Right | Сору | NC | Space | |
| 1 | &BFFD | Left | Down | Return | Delete | |
| 2 | &BFFB | _ | Up | | NC | |
| 3 | &BFF7 | 0 | P | | 1 | |
| 4 | &BFEF &BFDF | 9 | 0 | L | | |
| 5 | | 8 | 1 | K | | |
| 6 | &BFBF | 7 | U | J | M | |
| 7 | &BF7F | 6 | Y | н | N | |
| 8 | &BEFF | 5 | T | G | В | |
| 9 | &BDFF | 4 | R | F | V | |
| A | &BBFF | 3 | E | D | C | |
| В | &B7FF | 2 | W | S | X | |
| C | &AFFF | 1 | a | A | Z | |
| D | &9FFF | Escape | Caps Lk | Ctrl | Shift | |

Table I

| 18 REM PROGRAM III | 118 AND#1:TAY:STX Joy,Y |
|--------------------------|------------------------------|
| 28 REM Direct Electron J | 128 RTS: J: NEXT |
| oystick Read | 138 ?&228=Rjoys MOD256:?& |
| 38 REM Michael Jakobsen | 221=Rjoys DIV256 |
| 48 MODE2 | 148 +FX14,4 |
| 58 Joy=478: Jox=471 | 158 PRINT" "Joystick Read |
| 68 *FX163,128,1 | ": VDU23; 8282; 8; 8; 8; |
| 78 FORIX=8TO2STEP2:PX=&C | 168 REPEAT |
| 88: [OPTIZ | 178 PRINTTAB (8,5) "X="; STR |
| 88 .Rjoys:LDX&FC78 | \$?Jox;" ";TAB(18);"Y=";STR |
| 98 .Rjchn:LDA#4 | \$?Joy;" " |
| 100 EDR#1:STA Rjchn+1:ST | 188 UNTILE |
| A&FC78 | |

C&FASSOCIATES

BARGAIN PRICE ELECTRON SOFTWARE
Our
E Title RRP PRICE

| | | Oui | | | Out | |
|----------------------|------|--|-----------------------------|----|-------|-----------------------------|
| Title | RRP | PRICE | Title Ri | RP | PRICE | Title RRP PRICE |
| Bombjack | 9.95 | 7.50 | Southern Belle 7. | 95 | 6.50 | Bug Eyes 2 7.95 6.50 |
| Commando | 9.95 | 7.50 | Frak 7. | | 6.50 | Fantastic 4 Pt. 1 7.95 6.50 |
| Citadel | | 7.50 | Caveman Capers 7.: | 95 | 6.50 | Micro Olympics 5.95 4.95 |
| Exploding Fist | | | lan Botham Test 7.5 | | 6.50 | Mineshaft 6.95 5.95 |
| Yie Ar Kung Fu | 8.95 | 6.95 | Steve Davis Snooker 8.5 | | 6.95 | Zalaga 6.95 5.95 |
| 10 Computer Hits 2 | | 7.50 | Boffin 9.: | | 7.25 | Blagger 7.95 6.50 |
| 10 Computer Hits 1 | | The second second | Combat Lynx 8.: | | 6.75 | Twin Kingdom Valley 2.95 |
| Jet Set Willy | 7.95 | | Blockbusters 7.5 | | 6.50 | Golf 2.95 |
| Mouse Trap | | | Blockbuster Gold Run 9. | | 7.50 | Starforce 7 2.95 |
| Rick Hanson | | 7.95 | Treasure Hunt 9. | | 7.50 | Jack Attac 2.95 |
| Project Thesius | | | Bullseye 8. | | 6.95 | Ghouls 2.95 |
| Repton | 9.95 | | Terrormolinos 7. | | 6.50 | Escape Moonbase Alpha 2.95 |
| Repton 2 | 9.95 | | Giddy Game Show 9. | | 7.50 | Jet Power Jack 2.95 |
| Phantom Combat | | | Word Games with Mr Men . 9. | | 7.50 | Croaker 2.95 |
| Strike Force Harrier | | The second secon | Wheel of Fortune 8. | | 6.95 | Cybertron Mission 2.95 |
| Winter Olympics | | | Quest/Holy Grail 6. | | 5.95 | Electron Invaders 2.95 |
| Beach Head | | | Castle Frankenstein 6. | | 5.95 | Danger UXB 2.95 |
| Jump Jet | | | Kingdom of Klein 6.: | | 5.95 | Rubble Trouble 2.95 |
| Tempest | 9.95 | | Aces High 9. | | 7.50 | Gauntlet 2.95 |
| Karate Combat | | | Hampstead 6. | | 5.95 | Bandits at 3 O'Clock 2.95 |
| The Quill | | | Flight Path 737 5. | | 4.95 | Killer Gorilla 2.95 |
| Death Star | | | Dynabyte Collection 7.5 | | 6.50 | Stock Car 2.95 |
| Eddie Kidd | | | Chess 7. | | 6.50 | Galactic Commander 2.95 |
| Brian Jacks | | The state of the s | Chip Buster 7. | | 5.95 | Castle Assault 2.25 |
| Geoff Capes | | | Overdrive 7.5 | | 6.50 | Astro Plumber 2.25 |
| Stairway to Hell | | | Webwar 4. | | 4.50 | Diamond Mine 2 2.25 |
| Football Manager | | | Thai Boxing 5. | | 4.95 | Arabian Nights 1.99 |
| i ootball mailager | 0.00 | 0.00 | | - | | |

Orders normally despatched by First Class Post on day of receipt. But allow max. of seven days. All prices include VAT and P&P (Overseas orders add £1)

Total

Name ______ Title Cost ______

Make PO/Cheques payable to:
C & F ASSOCIATES
and send to:
C & F ASSOCIATES
PO BOX 2
BIDEFORD EX39 3RE.

Tel: (023 73) 619





Solving the riddle of the Sphinx save game routine

THE response to my request for a save game routine for Sphinx Adventure has been very good.

The first person to send me a routine was John Cummings and he wins a copy of **Woodbury End** and **Terror-molinos**, both of which are superb adventures.

I have listed below the changes that need to be made to Sphinx.

Still on the same subject

Rob Harley has written to say that I made a mistake when I said that the bad program fixer was in the December 1985 issue of *Electron User*. In fact it was in the December 1984 issue.

Rob goes on to say that there is a bug in Sphinx. If you type in " as a response to the What Now? prompt, the game crashes.

However typing in directly ?&5774=&FF and then typing in RUN gets the game running again. Rob goes on to say that issuing an *FX200,0 can prove handy too.

M. Wheeldon is our first Lord of Adventure. He has written in offering help on three adventures. See below for more details.

You will have noticed that I have been printing a series of maps of **Terrormolinos**. If there are any other maps you would like let me know.

44 LDMEM=&598A:D\$="nsewu d":KN=8:MS=8:S=8:WA=8:0=&C8 8:EX=&78:L=6

202 A\$=FNCV(A\$):IFLEFT\$(A \$,3)="inv"PROCL(1):80T0 191 ELSE IFA\$="load"PROClo ELS E IFA\$="save"PROCsa

2000 DEFPROCIO

2005 LOCALI, f

2010 PROCF

2020 f=OPENIN(f\$)

2030 FOR 1=0 to 255

DOME THOUTAL DALLACON

2048 INPUT#f,?(1+&C00)

2858 NEXT1
2868 INPUT#f,L,S,KN,MS,S,W
A,K,W1,I,X,T,CH,V0,KL,CF,D,
SA,FL,LI,C,V,B,BE,RA,LF
2888 CLOSE#f:A\$="look":END
PROC

2090 DEFPROCsa

2895 LOCALI, f

2188 PROCF

2118 f=OPENOUT(f\$)

2120 FOR 1=0 TO 255

2138 PRINTOF, ?(1+&C88)

2148 NEXT1

2150 PRINTOF, L, SC, KN, MS, S, MA, K, W1, I, X, T, CH, VO, KL, CF, D

,SA,FL,LI,C,V,B,BE,RA,LF

2178 CLOSE#f:A\$="look":END

PROC

2188 DEFPROCF

2190 INPUT*Filename?*f\$: IF LEN f\$>7 OR LENf\$<1 VDU7:P

RINT: 60TO 2198

2200 +OPT1,1

2210 ENDPROC

FEEDBACK

Linda Smith has written in with help for Harvey Reynold's problems in **Ghost Town**. You can't play the mirror, even though you think you should be able to.

You should TAKE BELL, GO EAST from the counter in the hotel, RING BELL, MOVE BED and TAKE TAPE.

Go back to the saloon and TAPE MIRROR, BREAK MIRROR, GO HOLE, PASS BOARD, TAKE \$200 and TAKE BOARD. When the ghostly pianist appears CLAP, PLAY PIANO, OPEN PIANO and READ MAP.

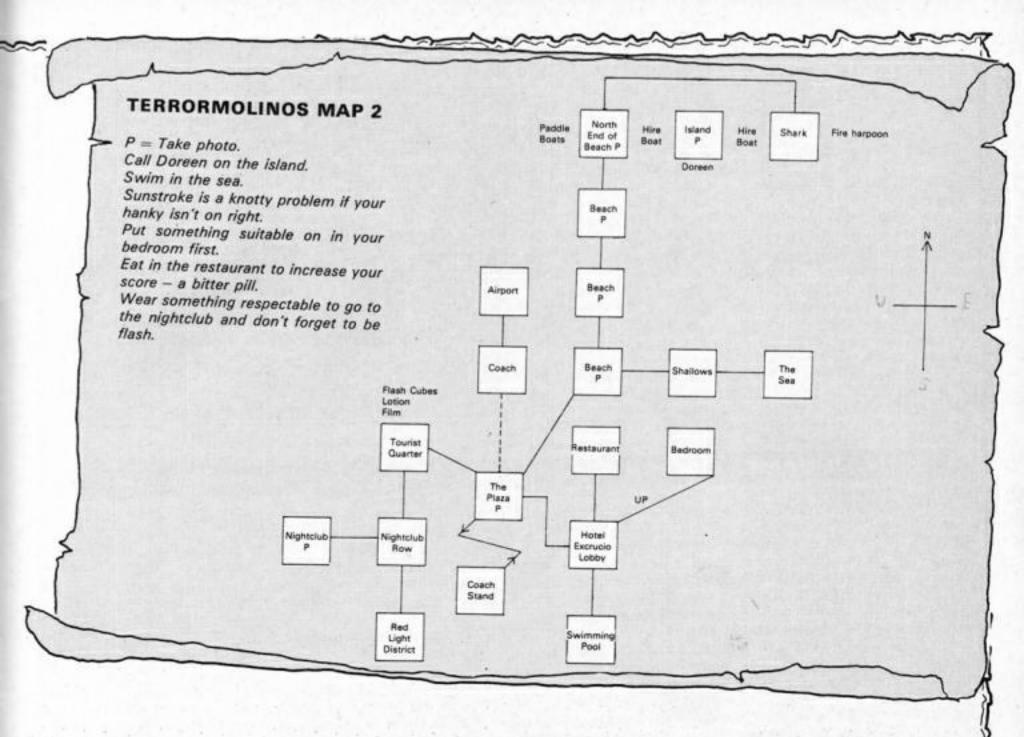
Geoff Larsen has written in again with lots of help with previous problems. To start with he has taken me to task for giving wrong information about **The Count**.

You do have to go into the oven, but go in at night when it is cooler.

With regard to Harvey Reynold's problem in bringing the telegraph keys together in Ghost Town – move the large safe in the telegraph office and repair the two loose wires.

Now press the second key in the line shack across the ravine – with the gunpowder having been left in a keg in the telegraph office.

In **Pyramid of Doom** you don't need to shoot the



LORDS OF ADVENTURE

This section is devoted to ardent adventurers who are prepared to answer reader's questions on particular games.

Write to them if you need help with the games mentioned, but please remember to send an sae with your letter.

M. Wheeldon of 225
Pensby Road, Pensby,
Wirral, Merseyside offers
help with Twin Kingdom
Valley, The Eye of Zoltan
and Firienwood.

nomad. If you have the gun he seems less likely to attack you anyway.

In **Spiderman** the block of ice is the frozen aquarium.

Terrormolinos has raised quite a few problems over previous months and Geoff has provided answers for these too.

Snorkelling in the bay will earn you more points. To take an excursion you should GO BULL, GO WINE or GO MONASTERY. To take the camera off the shelf you must first get and lock the steps and then climb them.

You also use the ladder to get to the loft and typing SWITCH ON will shed a bit of light on the scene. Geoff says that he has finished **Strange Odyssey** without translating the writing on the boulder.

In Escape from Pulsar 7
you must have first fixed the
oven before you can bake the
cake. To do this, a round block
must be constructed from a
square block on the repaired
lathe.

In Arrow of Death Part 2
Andy Hollis should use the large rock and SMASH SKELETON.

If anyone is a candidate for Lords of Adventure Geoff is. I hope you will put your name forward Geoff.

PROBLEM CORNER

J.J. Foggitt has written in with questions about several adventures. In *Castle of Riddles* he keeps drowning in the boat.

Yes, you need the bucket. Don't try to dig it out, just keep TAKING it. Then when you get to the boat bail out.

Don't just use an explosion to get rid of the giants, use it to open a box as well. When the giants have gone explore the gallery to find another treasure.

You'll find your score will increase when you put things in the safe. Haven't you

sos

Linda Smith is having trouble with **Ghost Town**. She wants to know if there is a word that will make the horse carry you rather than throw you off.

She also wants to know if you can get to the mountains, open the safe and what use are the fiddle strings. Can anyone help her out with these?

wondered what those letters on the wall mean? There's one in each location, they aren't all in one location.

In **Bored of the Rings** try inserting the battery into the vending machine. I'm not sure where location 17 is, but try planting some beans there.

Peter and Val Russell need to find Mr Snargsby to finish **Terrormolinos.** Go down into the catacombs, find him and call him.

The problem of finding the parachute in the forest in **Stranded** has cropped up again. Paul Dougherty says that he has tried CLIMB TREE, but gets the response "You can't do that now".

The reason for this Paul is that you are trying in the wrong place. Go north from the first location you come to in the forest and then try.

I have checked this on the game itself as well as on my map and it definitely works.

Susan Parsons and Robert Carlton have both written in

with the same

asking for help with Dracula Island.

The heavy thing is an iron ball and you can find it by going down in the hut near the start location, though you will have to have the knife and crucifix to get past the snake first.

Susan also needs to get the ball but should get the gloves from the armchair in the library first, then go back to the hut and DROP ROPE, LIGHT LANTERN, WEAR GLOVES and CLIMB ROPE.

If you sit in the armchair and drop the ball you can now find a secret door in the kitchen.

M. Wheeldon is having problems with *Five Stones* of *Anadon*. Move the tombstone in the cemetery.

Wear the gloves and get the plank, then go down. Use the plank to cross the pit and when you get to the rubble use the dynamite. You will soon find the cross.



HALL OF FAME

Woodbury End-Les Shipton

Here are some more clues:

- Bright light child's delight. Switch the beacon on in the auditorium.
- The bell can end the hell. Take the children to the village green when the clock chimes at midnight.
- Circular logic rules. Run around the oak tree to gain access to the fairground. RUN NORTH, RUN EAST, RUN SOUTH, RUN WEST, RUN NORTH then GO NORTH.
- Pal in drome not quite. To gain access to the chambers in the fairground move east from the door with the bat.

Wheel of fortune (continued) - Craig Romans

Explore the area you arrive at and head for the road leading south. You will hear a bird singing. Play the music box to get rid of it.

Now go to the china shop and ring the bell for service. Do what the man tells you and find the farmer. When you have found him tell him THE BULL IS IN THE CHINA SHOP and lead him to it. You will be rewarded with another penny.

Now go back to the field and explore it thoroughly. If you haven't managed to get past the snake you must drop the basket and play the flute.

Take the basket again and go to the canal bank. When you see the troll drop the basket and play the flute. The troll will run off and you can now enter his cave. You can leave your treasures here in safety.

Now go and fill the cup with oil, but remember to leave the basket outside the cave so that the troll can't get back in.

If you have got the silver bullet with you you should now go back up through the trapdoor. Go to the machine and insert the penny and get the gun.

Load the gun with the bullet and go to the well and get the bucket. Go to the building and spin the wheel.

Spiderman (continued) - Robert Henderson

When you see Dr. Octopus grab his arms and hit Electro. Now go to the penthouse and lower the thermostat until it is less than 32 degrees.

Then go to floor 1, get the aquarium and take it to the hall. Go back to the penthouse and turn the thermostat back up. Go back to floor 1 and get the gem out of the aquarium.

Take everything you can carry, including the aquarium, Electro, the couch and so on, and drop it all on the giant scale.

Now go to floor 3 and type RUN on the computer. Go to the presses and get the newspaper, open it and get the gem. There are also gems in the lift shaft's tool niches. You must leave gems with Madame Web regularly or your inventory will soon fill up. In addition to gems I have mentioned there are also some just lying about but you'll have to find them.

When you have deposited all the gems with Madame Web type SCORE. The chief examiner will appear and tell you a password.

The Count (continued) - A.J. Haynes Day Two.

Raise the dumb waiter to the pantry. Take the matches, sheets and garlic and go down in the waiter to the dungeon. Find the pit and tie the sheets to the rings.

Climb down into the pit and light a match to reveal a torch. Climb back up the sheets and go to the front door and wait for the package – postcard and note – to be delivered.

Take everything to the closet, open the package and store it all here – except the blood and clip. Lock the door and go back to bed and sleep.

Revenge of Zor - H.J. Bastien

Some more hints that should help:

Rub the ring to kill the hydra. Wear the spectacles to read the book. Use the casket to keep the torch and matches dry.

Examine the sandwich to get the flies and eat the sandwich to move the boulder.

The key is behind the waterfall. GIVE COINS to enter the carriage. Make sure you have the right objects before entering – once in, you can't get back.

Robin of Sherwood - Martin Hanson

First of all you must escape from your cell so STAND on the PRISONERS and then GRAB the guard's ANKLE when he passes overhead.

Then STRANGLE GUARD, EXAMINE GUARD, GET SWORD, PULL BOLT and OPEN GRATING. Next GO DOOR, GO BATTLEMENTS, GO DOOR, GO RIGHT and GO WINDOW.

You now need to map out the forest. From your start location in the forest imagine you are on a horizontal line. You can move three locations east and four locations west.

At no point on this line can you move south. Including your start location the map extends for eight locations vertically.

This means that there are 64 locations on your map (8×8). There are also several locations outside this square.

Your first task is to explore the limits of the map and discover these extra locations then compile a map to show all the locations both inside and outside the square.

Micro Messages

I HAVE had an Electron for just over a year. In that time I have added a Plus 1, an HR5 printer and recently the Plus 3.

The computer has been used for Scout records, letters, and training. A morse code program was very useful for the communications badge. (Four of the boys also have Electrons.)

At the local gala road race the computer was used to keep those waiting at our town hall start/finish up to date with the race.

The details of 250 runners were programmed in. Their numbers were radioed over Citizens Band from the refreshment/first aid points on the route.

They were entered into the Electron which displayed on monitors the runners' position, time, and details for the waiting crowd and for the race controllers to announce over the public address system. This was very successful.

I am also involved with the local dramatic society as theatre electrician for lighting, sound and effects.

At two productions, both requiring fairly complex and fast sound effect plots, I used the Electron programmed with *MOTOR commands and TIME delays to cue the taped sound effects.

The monitor was used to display instructions and cue lines for the operator. This allowed my colleague to stand in successfully after only one practice.

This method of controlling the cassette player is much better than watching the tape counter and controlling the cassette manually.

It makes possible putting all the sounds on one tape as the sound required next can be called very quickly by pressing say the Spacebar.

The problem with this system is that it is under the control of the one relay inside the Electron. Are there any publications available which could be of help in making a circuit to control other relays via, say the Plus 1 ROM sockets?

This would greatly increase

Electron proving a Jack of all trades

the possibilities for computer controlling many other low voltage powered effects at present requiring manual switching — lan Johnston, Moffat, Dumfriesshire.

 We don't know of any publications describing the use of the Plus 1 ROM socket.

Advanced Computer Products are working on a Plus 5 interface which may be suitable for control applications.

Parents often know best

I FEEL for O. F. Foreman (Micro Messages, June 1986). However, in my children's school they believe satisfactory educational software can never be commercially produced; only teachers, in day-to-day contact with pupils, can assess requirements accurately.

Accordingly, they write their own software as far as possible – most teachers under about 40 have used computers in some form at university.

If they get bogged down, they write to parents for advice. After all, there are many parents nowadays who use computers at work.

Besides, we know the latest tricks of the trade to shorten programs.

Such programs are copyrighted in the name of the school but no fees are expected or paid. We parents also are vitally interested in our children's education!

Come on, Mr Foreman. If you can't write the software yourselves, swallow your pride and ask the parents. You will be astonished by the response.

How many commercial software packages do you think are not amended by users to suit individual company quirks? Do you expect your traditional chalkboards to write themselves?

Computers are a useful tool at any school but software must be the smallest problem.

R. H. Hill, Woodford Green, Essex.

Clues for Commando

I HAVE some hints for the Electron version of Commando. First of all do not try to shoot masses of enemy soldiers while you are in no man's land

Find some cover to hide

behind before you start to eradicate the enemy soldiers. If there are any mortars in the vicinity, get as close as possible to them and either fire a round or throw a grenade.

Throwing grenades at mortars is recommended because you do not have to get as near to the mortar emplacement and thus the risk of death is far less.

This method of killing lots of soldiers is best used at the start of the game because you can increase your number of lives from three to around nine — the more lives you can obtain the better your chance of completing the game.

Also collect as many boxes of grenades as you can. Do not bother throwing grenades at single soldiers because this is uneconomic.

When you arrive at a bridge throw a grenade just before you enter the tunnel and walk in the central part of the tunnel, so you can avoid any surviving soldiers.

When you arrive at the opening gates, move in line with the opening and throw a grenade. This will kill the first soldiers who come through the gate and give you more time to manoeuvre.

Keep firing bullets while soldiers are coming at you from any direction; this will kill most of them.

On the second level there is a camp in front of the second gate and quite often a soldier hides here.

To kill him move to the bottom of the relevant side of the screen and fire bullets or throw grenades. If this method fails, wait and the soldier will move out from behind the camp, when you can shoot him.

On the third level there are no real problems apart from

ALL programs printed in this issue are exact reproduction of listings taken from running programs which have been thoroughly tested.

However on the very rare occasions that mistakes may occur corrections will be published as a matter of urgency. Should you encounter error messages when you type in a program

they will almost certainly be the result of your own typing mistakes.

Unfortunately we can no longer answer personal programming queries concerning these mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in the mail pages.

two mortars just before gate three. Again throw grenades to destroy these emplacements.

Level four, the final one, is very simple. Again use grenades wisely. The rules for gates also apply at the fortress.

From there hints you will be able to tell I have completed the Electron version of Commando. Am I the first to do this? – David Tester, Bolton, Lancs.

 You're certainly the first reader we've heard of to complete the game. Thanks for the hints and tips.

In need of a new Elite

ARE all you Elite fans now bored with it, having become Elite? If so get writing to Acornsoft and convince the authors of this great game that we need a follow-up.

Maybe an even more futuristic game with a new faster, powerful type of ship – the Cobra Mk IV maybe?

Once you have achieved Elite status and have all the "bolt-ons" for it, the game is far too easy, I'm sure you'll agree.

So start writing and maybe they will see the advantage of such a game. After all, the original did sell very well. - Commander Scorpio, (Elite).

Splash got me in deep water

AS an experienced typist, but a newcomer to typing in computer listings, I would like to call your attention to the game Splash it all Over" in November 1985 issue of Electron User.

Many beginners must have found this program impossible to do without consulting an expert — which I had to do before overcoming the problem.

I am referring to line 640 which cannot be typed completely unless abbreviations WHAT would you like to see in future issues of Electron User?

What tips have you picked up that could help other readers?

Here is your opportunity to share your experiences.

Remember that these are the pages that you

write yourselves. So tear yourself away from your Electron keyboard and drop us a line. The address is:

Micro Messages Electron User Europa House 68 Chester Road Hazel Grove Stockport SK7 5NY.

are used, but you made no mention of this.

I can only type to the final VDU whereupon the computer goes on strike and refuses to accept any more of that line. —

F. Harvey, Longford, Coventry.

 Occasionally you will come across lines that are apparently too long to fit in and the Electron simply refuses to accept them.

In these cases using the abbreviations listed in the Electron User Guide will solve the problem.

As all submissions to Electron User must be on tape or disc so they can be thoroughly tested we never actually type them in. Consequently this problem can easily be missed.

Has backup broken down?

I RECENTLY bought an Electron with Plus 3 disc drive unit. Like M. Lowdon (Electron User June, 1986), I am unable to successfully transfer the Acornsoft Database program to a blank formatted disc.

I have tried using the Welcome disc utility *BACKUP. However I think that there must be a bug in this particular program.

The basic problem is that the program fails to terminate — no prompt reappears and/or no instruction is given to say that the copying process is completed.

The computer continually gives the instruction to swap the source and destination discs.

After swapping for 20 or 30 times, if this process is terminated by Control and

Break, the database program has been copied on to the blank disc, although it is corrupted. Various error messages appear when any attempt is made to use the backup copy.

I have also used *DIRCOPY, following the instruction on page 11 of the Plus 3 manual and user guide errata (press Return twice in place of "Library" to backup the whole disc).

Once again, I have been able to make a copy onto a blank disc, but when attempting to add records to a file the program crashes and the error bad program appears.

Incidentally, I obtained a replacement Welcome disc from Acorn but the same problems are apparent.

Can you tell me what is wrong? Is there a fault on my computer or disc drive unit? – P. Harmes, Buckley, Clwyd.

Nothing is wrong with the backup utility on your Welcome disc or your Electron or drive, the utility is simply very slow at copying discs and requires around 80 disc changes.

If you press Break after 20 or 30 disc changes only part of the disc will have been copied and the rest will have been corrupted.

A Plus 3 disc stores over 320,000 bytes of information and the Electron only has around 17,000 bytes of RAM free.

This means that even if all the free memory could be used a disc could only be copied in chunks of 17k, and each chunk requires two disc changes. That adds up to about 36 changes.

You'll find a fast backup utility in the February 1986 issue of *Electron User* which reduces the number of disc changes to around 25.

A routine check-up

SINCE owning a Plus 3 disc drive I have been successfully using the downloading routine included in your listing of Skramble to load games from disc

Recently however I have found two examples which will not run using this routine.

These are Time Bomb and Higher or Lower both from July 1985 issue of Electron User.

These games produce the error 'No room at line . . .' yet both work perfectly when loaded from cassette with Page set to &EOO.

Do you know how the games can be run from disc?— Stephen Thomas, Bishopsworth, Bristol.

 The solution is quite simple:
 Define function key 0 to download the program using:

*KEY8 *T.:MDX=PAGE-&E88:FOR IX=PAGE TO TOP STEP 4:!(IX-DX)=IX!:NEXT:PAGE=&E 88:MOLD:MRUN:M

then when the program has loaded press f0 to run it.

Actually adding the function key definition to the listing may cause it to run out of memory.

Invasion Force out of line

ALTHOUGH the discovery of your magazine has vastly increased my understanding of the Electron I do have one small complaint to make.

Having faithfully typed in the listing of Invasion Force in the April 1986 issue I was not amused to find it wouldn't run.

The fault seems to exist in line 100, and no matter how many times I check it the result is always the same.

Please tell me that the listing is incorrect. I would hate to think that my wife, next door neighbour and myself are all going blind.

The error message is 'No

Super show, but no space

I HAVE just returned from another superb Electron and BBC Micro User Show – all-be-it rather jaded after the crush. Well done Database Publications for continuing to support the BBC Micro and Electron as you do.

Several items come to mind after this visit which I feel to be worthwhile a mention in your columns, and to the interest of your readers.

Firstly the show itself. So much to see, but even with my own 6ft 4in and 17 stone, great difficulty in being able to see much due to the sheer volume of human bodies in such a confined space, and this on the first day.

Any children, and this included by own son who accompanied me (this day off school considered to be of great education value) had great difficulty in being able to get near any of the stands.

I was concerned also for the several disabled persons in wheelchairs — their task on Friday was almost impossible. is it not time that Database considered an exhibition centre which will adequately house the show, even if this means higher entrance fees?

The freedom of movement and ability to see all would more than compensate for any increase in prices.

A word also to Slogger and ACP, please increase the size of your respective stands. If interest in your products in support of the Electron continues, as there is no doubt that it will, at future shows your stands will be trampled under the crush.

I attempted on two occasions to get near the ACP stand, and after half an hour in the crush, gave up the attempt.

Micronet 800 were as unhelpful as ever. At the Autumn 85 show, I was assured by this stand that material for the Electron would quickly become available on Micronet 800 with the launch of the Pace Nightingale/Commstar package. Taking

their word, I quickly bought this communications package, and over six months later I am still waiting for one single frame on the whole of Prestel/Micronet which supports the Elk.

I am continually told that Electobeeb, page 800931 is the answer to my problems, but all this does is increase my frustrations for it appears to be entirely dedicated to the BBC Micro and should more honestly be recalled Beebspot.

Micronet really should get their act together and provide the service which their sales patter offers. After all, we Electron owners pay the same subscription as all the other PC users who are most adequately catered for.

In the defence of Micronet, I was advised by the staff at the stand that they have very few Electron users on the system, so maybe the solution lies in our own hands, to apply pressure until we get a response.

Slogger and Pace have

problems with compatibility between the Plus 1 upgrade ROM and Commstar ROM.

With the Plus 1 upgrade chip fitted, and calling Commstar, the Electron locks up.

A telephone call to Slogger after the show was as helpful as ever. "Yes there was a problem, and yes we are looking into it, and yes, we will be in touch when it is solved".

Great after sales service well done Slogger once more.

Shouting across the crush to the ACP stand, I was assured that the ACP 5 will be on the market shortly. This is the item all serious Electron users have been waiting for.

So another show is over and I am even more convinced that the Electron as a little acorn is steadily growing into a mighty oak.

Keep up the good work chaps. Keep producing the goods and we will continue to part with our money — if we can get near the stands that is! — Trevor Dunkerley, Reading, Berks.

such variable at line 100'. – D.W. Daglish, Drumchapel, Glasgow.

 The listing is correct. In fact this is the first letter we've had concerning Invasion Force.

If you've checked line 100 several times then it probably is correct and you aren't going blind at all.

'No such variable' is a peculiar error report in that often the error is elsewhere in the program and not in the line at which the Electron stops. Please check the whole listing carefully.

Connection quandary

I AM almost about to order an Electron Plus 1, but have one doubt. If I buy the Plus 1 is it a simple matter of connecting up a compatible printer by plugging it in, or is some other device necessary before it can perform?

The printer in question is an Epson. – G. T. Jackson, Liverpool.

• The only additional piece of equipment you'll need to use a printer is a cable with the appropriate connectors at either end. You should be able to buy one with your printer.

OLD remedy for recovery

I HAVE a query concerning the soft and hard break facility on the Electron.

Everything I've read says that a hard break has the same effect as turning the computer off and then on again, completely resetting it.

I have noticed recently,

however, that I have been able to recall programs using OLD after doing a hard break. Is it normal to be able to do this? – Paul Williams, Weston Super Mare.

 A hard break isn't quite the same as turning the Electron off then back on. If you enter:

*FX200.8

it will be possible to recover the program using OLD. If, however, you enter:

#FX200,2

you will not be able to recover the program since the Electron will clear all the memory from &400 upwards.

Wrong type of answer

I RECENTLY bought an Acorn Electron and am capable of writing a few simple programs, but I have hit a snag with programs using INPUT, for instance:

10 REM Program

20 PRINT "Are you old?"

38 INPUT answer

Now how do you get the computer to print two different statements, depending on whether the INPUT answer is "yes" or "no"? - James Baker, Scole, Norfolk.

 What you are inputting here is a number when you really want a string. Change answer to answer\$ and add these lines:

40 IF answer*="YES" THEN
PRINT "I don't mind."
50 IF answer*="NO" THEN
PRINT "Ok."

electron

Listings galore!

Save yourself the chore of typing in listings by sending for our monthly tapes, packed with games, utilities, graphics and other programs from the pages of *Electron User*.

On the August 1986 tape:
HOWZAT! A vivid recreation of a
day's test cricket for two players. 3D
MAZE Quick reactions and a sense
of direction are needed to escape
from our twisty maze. TEXTED Let
this versatile text editor turn your
micro into an electronic typewriter.
DRIVER A powerful printer driver
for View.

On the July 1986 tape:
ROYAL WEDDING Celebrate the
royal event with our ingenious sliding
block puzzle. SNAPDRAGON Two
player version of the classic card
game. ATTRIBUTES Colourful two
player strategy game. FORMATTER
Make your listings easier to read.
DISCS Extended star commands.
EXTRA COMMANDS A WHILE...
WEND command for your micro.
PLUS superb digitised picture of
Andrew and Sarah.

On the June 1986 tape:
FISHING Enjoy a quite day by the river, and maybe catch your tea as well! TACTICAL PURSUIT A two player strategy game played with pawns on a chess board.
MINIBASE Create an electronic telephone directory. EXTRA COMMANDS Add more commands to Basic. SCREEN DUMP Multi-tone screens dumps for Epson compatible printers.

On the May 1986 tape;
MISSILE JAMMER Defend the
city of Pezina from a missile invasion.
VECTOR LETTERS Use *LINE to
create double height text. DEGREES
Convert from Centigrade to
Fahrenheit and vice-versa.
CROCODILE TEARS Spell well or
end up as a crocodile's dinner. ZAP
Blast the marauding aliens. EXTRA
COMMANDS Adding new
keywords to Basic.

On the April 1986 tape:
INVASION FORCE Exciting zap
'em space game. EASTER EGG
HUNT Seasonal game using
compass points. BACH TO BASICS
Music tutor. NOTICE BOARD Text
scrolling utility. SEARCH and
RECOVER Two routines from the
disc article. NOTEBOOK Recursion
backwards.

On the March 1986 tape:
GRAND PRIX Exciting race game.
DICER A clever test of strategy.
MARCHING ORDER Counting and ordering numbers. FIND AND
REPLACE Useful editing program.
SECTOR EDITOR Excellent disc utility. TIMEPIECE Superb graphics demonstration. OXO Game of curning. TRICIRC A circle of

On the February 1986 tape: NECROMANCER Superb text adventure. GREBIT Arcade action. FAST BACKUP Disc utility. MACHINE CODE How to write an arcade game. TAPEDISC More software transferring techniques. SIDEWAYS RAM Example program.

On the January 1986 tape: FRUIT WORM An arcade classic. HELICOPTER RESCUE Pilot an air sea rescue helicopter. MACHINE CODE Detect collisions between sprites. TAPEDISC Transfer your software to disc. MODE012 Multi-Mode screens.

On the December 1985 tape: GET SET SANTA Christmas fun collecting presents. MISSILE ATTACK Save your cities! PROGRAM PROBE Using joysticks. SPACE COUNT Counting for youngsters. CHRISTMAS CARD Cards and carols for all. DISC MENU Disc Menu creator.

On the November 1985 tape: KARATE WARRIOR Electrifying combat. ULA Mode 6 Mode 7! PAINT ROLLER Colourful arcade action. DEFUSE Beware the bombs. SPRITE PRINT Machine code graphics utility. TRAIN Far from stationery graphics.

On the October 1985 tape:
DUNGEON QUEST An amazing all action arcade adventure. PILOT Computer assisted learning language.
RAVING ROLLER Arcade action in the garden. TRAIN Animated action.
KALEIDOSCOPE Colourful graphics action.

On the September 1985 tape: TEXNDAN 3D Wild West shootout. PINTCURSOR Machine code graphics. SPRITE/ED Sprite editor. COMPOSE Writing music simplified. REVERSI Cunning strategy game. SIMPLEFILE Save and read data. BOUNCE BALL Two player action. ROTATE Animation in a spin.

On the August 1985 tape:
DIGGA Exciting arcade action
beneath the earth. DODGE THE
ASTEROIDS Fun deep in space
among the asteroids. M/CODE
GRAPHICS Sliding pints of beer!
*FX The OS explored. MOVEIT An
intriguing sliding puzzle. HEXGRAM
An educational game to increase
your word power.

On the July 1985 tape:
MANIC MOLE Machine code action
at its best. HIGHER OR LOWER
Guess the card. TIME BOMB
Carefully collect TNT. M/CODE
GRAPHICS Two demonstrations.
FX1/2 The OS on call. PIRATE
MATHS Sum fun. NOTEBOOK
Password Generator.

On the June 1985 tape: QUASIMODO Beliringing classic. DISASSEMBLER Machine code utility. ACTIVITIES Educational fun. REFLECT Aggressive aliens. ENGINE Animation. DODGE Race track action. STRINGALONG Scrolling fun. CASTLE Medieval graphics. MATHS CURVE Angles and art. NOTEBOOK Trees.

On the May 1985 tape:
SKRAMBLE! Compulsive arcade action. SHEEPNIM The logic game.
TEXTWRITER Screen utility. LIFE A cultured classic. CEDRIC Educational fun. THREE-D Outstanding utility. SPOKES Fascinating graphics. MOONORBIT Heavenly displays. BLAZON Heraldic devices. FLOWERS A Basic bouquet. NOTEBOOK Annotated animation.

On the April 1985 tape:
SUPER ARCHER Target practice.
BINARY SEARCH Search data
efficiently, JOYPLUS Switched
joystick routine. ODD ONE OUT
Educational fun. POLYGONS 3D
rotation. MONEY CRAZY Arcade
action. STARCHART The night sky.
FORTUNE TELLER Horoscope.
COLLISION DETECTION Alien
encounters. HILO Guessing game.
NOTEBOOK Hello to assembler.

On the March 1985 tape:
MR. FREEZE Ice cube arcade action. SCREENDUMP Two procedures for printer dumps.
FILLER The machine code fill routine. FRED'S WORD GAME Educational fun. BIG LETTERS Large text utility. PERCY Beat the burning fuse. ANIMATION Two example programs. PIGS Fying bacon. NOTEBOOK Display

On the February 1985 tape:
CRAAL The mystifying maze
adventure. BOUNCY Addictively
annoying action. PAIRS Can you
remember the cards? BASE A
Binary/hexadecimal conversion utility.
CATCHER Collect the eggs before
they break. CLOCK Time-keeping
utility. RACER Grand Prix action.
NOTEBOOK Graphics windows.
TRIG All the right angles.

On the January 1985 tape:

SPACE BATTLE Destroy the deadly descending aliens! NEW YEAR A sound and graphics greeting.

ESCAPE FROM SCARGOV Minefield action. PIE CHART Statistics made simple.

CLAYPIGEON An Electron birdshoot. ORGAN Music maestro please! NOTEBOOK An original program. RANDOM NUMBERS Or not so random! SNAKES Reptilean arcade action. CHEESE RACE Beat rival mice.

On the December 1984 tape: CHRISTMAS BOX Align the presents logically. SILLY SANTA Sort out the muddle. SNAP Match the Xmas pictures. RECOVERY The Bad Program message tamed. CAROL Interrupt driven music. AUTODATA A program that grows and grows. NOTEBOOK Simple string handling.

On the November 1984 tape: STAR FIGHTER Anti-alien missions. SCROLLER Wrap around machine code. URBAN SPRAWL Environmental action game. SPELL Alphabetic education. JUMPER Level headed action. CAESAR Code breaking broken. KEYBOARD Typing game.

On the October 1984 tape: BREAKFREE Classic arcade action. ALPHASWAP A logic game to strain your brain. SOUND GENERATOR Tame the Electron's sound channels. MULTICHARACTER GENERATOR Complex characters made simple. RIGEL 5 Out of this world graphics. MAYDAY Help with

your morse code. NOTEBOOK

聯

Palindromes and string handling.

On the September 1984 tape: HAUNTED HOUSE Arcade action in the spirit world. SPLASH A logic game for non-swimmers. SORT SHOWS How sorting algorithms work. SORT TIME The time they take. CLASSROOM INVADERS Multicoloured characters go to school. SAILOR Nautical antics. MATHS TEST Try out your mental

On the August 1984 tape: SANDCASTLE The Electron seaside outing, KNOCKOUT Bouncing balls batter brick walls. PARACHUTE Keep the skydivers dry. LETTERS Large letters for your screen. SUPER-SPELL Test your spelling. ON YOUR BIKE Pedal power comes to your Electron. SCROLLER Sliced strings slide sideways.

On the July 1984 tape:
GOLF A day on the links with your
Electron. SOLITAIRE The classic
solo logic game. TALL LETTERS
Large characters made simple.
BANK ACCOUNT Keep track of
your money. CHARTIST 3D graphs.
FORMULAE Areas, volumes and
angles.

On the June 1984 tape:
MONEY MAZE Avoid the ghosts to
get the cash. CODE BREAKER A
mastermind is needed to crack the
code. ALIEN See little green men —
the Electron way! SETUP Colour
commands without tears.
CRYSTALS Beautiful graphics.
LASER SHOOT OUT An
intergalactic shooting gallery.
SMILER Have a nice day!

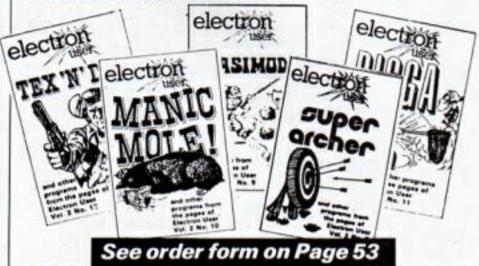
On the May 1984 tape:
RALLY DRIVER High speed car
control. SPACE PODS More aliens
to annihilate. CODER Secret
messages made simple. FRUIT
MACHINE Spin the wheels to win.
CHASER Avoid your opponent to
survive. TIC-TAC-TOE Electron
noughts and crosses. ELECTRON
DRAUGHTSMAN Create and save
Electron masterpieces.

On the April 1984 tape:
SPACEHIKE A hopping arcade classic. FRIEZE Electron wallpaper.
PELICAN Cross roads safely.
CHESSTIMER Clock your moves.
ASTEROID Space is a minefield.
LIMERICK Automatic rhymes.
ROMAN Numbers in the ancient way. BUNNYBLITZ The Easter program. DOGDUCK The classic logic game.

On the March 1984 tape:
CHICKEN Test your nerve.
COFFEE A tantalising word game.
PARKY'S PERIL Parky's invisible
maze. REACTION TIMER How fast
are you? BRAINTEASER A
puzzling program. COUNTER Mental
arithmetic. PAPER, SCISSORS,
STONE Out-guess your Electron.
CHARACTER GENERATOR
Create shapes.

On the February 1984 tape: NUMBER BALANCE Mental arithmetic. CALCULATOR Make your Electron a calculator. DOILIES Patterns galore. TOWERS OF HANOI The age old puzzle. LUNAR LANDER Test your skill. POSITRON INVADERS The old arcade fayourite.

On the introductory tape:
ANAGRAM Sort out the jumbled letters. DOODLE Multicoloured graphics. EUROMAP Test your geography. KALEIDOSCOPE Electron graphics run riot.
CAPITALS New upper case letters. ROCKET, WHEEL, CANDLE Three fireworks programs. BOMBER Drop the bombs before you crash. DUCK Simple animation. METEORS Collisions in space.



and taking advantage of this money-saving offer!





can also take advantage of

this exceptional offer.

SAVE up to 50% on insuring your Electron (as well as your monitor, Plus 1, printer...)

Electron User has negotiated special terms with one of Britain's biggest insurance companies to cover your Electron system (including all peripherals) against theft, breakdown or accidental damage.

Your system is covered while it is in your own home, while it is temporarily elsewhere, and even when it is in transit - but only within the UK.

Examples of this special price:

| System worth | Premium |
|--------------|----------|
| £200 | From £10 |
| £500 | From £16 |
| £1,000 | From £35 |

Different rates apply to rural, urban and metropolitan areas.

A scheme is also available for businessmen which provides additional cover. Details on application.

Comhill Insurance plc. have underwritten this offer.

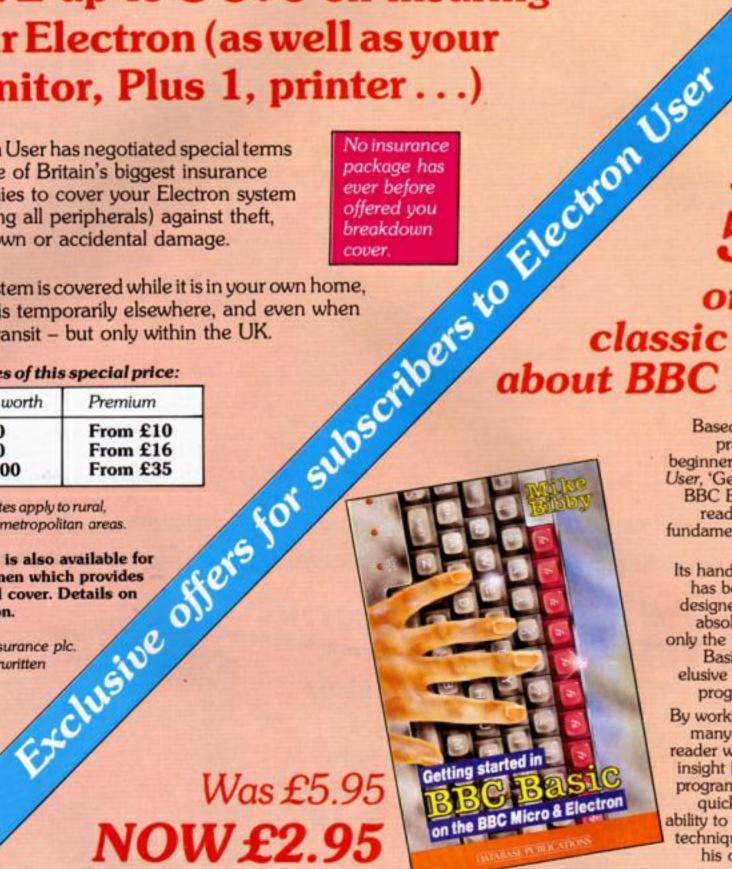
> Was £5.95 NOW £2.95

on this classic book about BBC Basic

> Based on the highly praised series for beginners in The Micro User, 'Getting started in BBC Basic' takes the reader through the fundamentals of writing programs.

Its hands-on approach has been specifically designed to teach the absolute novice not only the formal rules of Basic but also that elusive quality - good programming style.

By working through its many examples, the reader will gain a clear insight into structured programming and will quickly acquire the ability to use structured techniques in creating his own programs.





Your Electron needs protecting!

Protect your Electron with our luxury dust cover made of soft pliable waterresistant vinyl, bound with strong cotton and decorated with the Electron User logo.

Keepyour copies neat and clean!

This handsome binder is bound in attractive red pvc with the Electron User logo in gold blocking on the spine. It will hold 12 magazines firmly secured in place by metal rods.







election MAIL ORDER OFFERS election ORDER FORM

| All prices include postege, packing and VAT | Valid to August 31, 1986 |
|--|--|
| Overseas orders sent exclusively by Air Mail E p | Please enter number required in box £ p |
| ## Electron | Electron User annual subscription UK & Eire (Sterling only) £12 3001 Europe £20 3003 Overseas £35 3004 Commence with issue |
| UK Golf July 1984 3037 E4.75 Castles of Sand Aug 1984 3039 Europe/ Haunted House Sept 1984 3040 Overseas Star Fighter Nov 1984 3042 | Renewals UK & Eire (Sterling only) £12 3002 Europe £20 3476 Overseas £35 3477 |
| Christmas Box Dec 1984 3043 Space Battle Jan 1985 3044 The Kingdom of Craal Feb 1985 3046 Mr Freeze Mar 1985 3046 Super Archer April 1985 3047 | Electron Advanced User Guide £3.45* 3072 Insurance offer – I want to know more 2477 Getting Started in BBC Basic £2.95* 3100 |
| Skramble May 1985 3048 Quasimodo June 1985 3049 Manic Mole July 1985 3050 Digga Aug 1985 3051 | Offers available to all subscribers |
| Tex'n' Dan Sept 1985 3052 Dungeon Quest Oct 1985 3053 Karate Warrior Nov 1985 3054 Get Set Santa Dec 1985 3055 Fruit Worm Jan 1986 3056 Grebit Feb 1986 3057 | Cassette tape £35 UK 3005 annual subscription £45 Europe/Overseas Commence with |
| Grand Prix Mar 1986 3300 Invasion Force April 1988 3301 Missile Jammer May 1986 3302 Fishing June 1986 3303 | Renewals £35 UK £45 Europe/Overseas |
| Royal Wedding July 1986 3304 Howzat Aug 1986 3305 | |
| | Classic Arcade |
| Electron User back issues | (See p. 42) |
| £1.50 UK £2.50 Europe £3.50 Overseas E3.50 Overseas E4.50 Overseas E5.50 Ov | Fun School tape Under-5s 3080 Ages 5-8 3081 See p.51) £4.95 UK Ages 8-12 3082 55.95 Europe/Overseas |
| August 1985 3025 September 1985 3026 October 1985 3027 November 1985 3028 December 1985 3029 January 1986 3030 N/A | Mini Office (See p. 63) E5.95 UK E6.95 Europe/Overseas |
| February 1986 3031 March 1986 3200 April 1986 3201 May 1986 3202 June 1986 3203 July 1986 3204 | Ten of |
| | Classic Card and No.1 Tape £5.95 3090 |
| Flootron Wordprocessor | *Add £1 for Europe *Add £2 for Overseas (See p. 61) |
| Plus 1 + View ROM cartridge | Dust cover 3058 (See p.52) £3.95 UK |
| Electron Workstation Package £69.95 UK 3085 | (See p.52) £3.95 UK £4.95 Europe/Overseas |
| Electron Data Manager Package £149.95 UK 3086 | Binder £3.95 UK 3059 |
| Plus 3 + Data Manager UK only Full details of offers on centre pages. | >>> TOTAL |
| A STATE OF THE PARTY OF THE PAR | |
| Send to: Electron User FREEPOST, Europa House, 68 Chester Road, Please allow 28 Hazel Grove, days for delivery Stockport SK7 5NY. | Payment: please indicate method (>) Access/Mastercharge/Eurocard / Barclaycard / Visa Card No |
| Order at any time of the day or night | Name |
| Telephone Orders: Orders by Prestei MicroLink/Telecom Gold 72:MAG001 | Address |
| Don't forget to give your name, address and credit card number | Post Code |
| ENQUIRIES ONLY: 061-480 0171 9am-5pm | Tel |

BY NOW you should be drawing coloured lines all over the place. All you need are the GCOL, MOVE and DRAW commands and some numbers for them to work on.

Put the Electron into Mode 1 with:

MODE 1

and then select the colour red with:

SCOL 0,1

The mode change will have moved the graphics cursor to the bottom left of the screen – the point with coordinates 0,0. Next draw a line across the display with:

DRAW 1279,1823

Now take a look at the screen. Unless you've done some mistyping or added a few commands you should have a screen with the last two commands — the GCOL and DRAW — at the top left. Also there's our red line, which is the result of these commands.

Notice that our GCOL command didn't affect the colour of the text, which is still white. If we wanted red text we'd have to use:

COLOUR 1

to do it.

Another thing to notice is that the graphics cursor and the text cursor are completely different things. The text cursor is the annoying flashing white line.

At the moment – unless you've altered or added to the above commands – this is three lines down the screen, by the prompt. It shows where the next bit of text is going to be printed.

Meanwhile the graphics cursor is at the top right of the screen, point 1279,1023. Our DRAW moved it there from its original position at the bottom left, leaving a red line trailing behind it.

From all this you should see that the Electron treats text and graphics displays very differently. In fact it looks on



Part six of the Electron graphics series by TREVOR ROBERTS

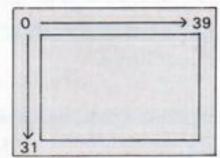


Figure 1: Mode 1 text screen

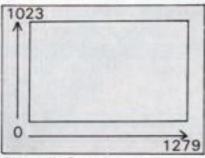


Figure II: Graphics screen

them as two completely different screens, one for text and one for graphics.

They just happen to coincide at the start of things. With the micro in Mode 1, Figures I and II show the Electron's slightly schizoid view of the screen.

However it's not just the Electron which looks at the screen in two ways at once. When we want to print something at a particular point on the text screen we use PRINT and TAB looking on the screen as it's described by Figure I.

It's usually one of the first things learnt in Basic. If we need coloured text then COLOUR is brought into play.

Yet if we want coloured lines we use DRAW and GCOL along with the coordinate system shown in Figure II. Let's face its, we've got the same divergent ways of looking at the screen as the Electron.

As I've said, at switch-on or after mode changes the text screen and the graphics screen cover the same area, the whole of the display.

However, it doesn't have to be like this. We can define a text window as a rectangular area of the screen in which all the things we PRINT and TAB are made to appear.

In effect the text screen that originally occupied all the display is reduced in size to take up only part of it. The command for creating a text window is:

VDU 28,bottomx,bottomy, topx,topy

The VDU bit tells the Electron that it's one of the commands that refer to the Visual Display Unit – the telly or monitor. The 28 indicates which particular action to take – in this case to create a text window.

The four figures that follow are the coordinates of the bottom left and top right corners of the text window. These are measured in character spaces and lines from the

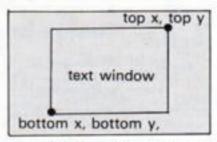


Figure III: Text windows - the coordinates used

top left corner of the screen, just like TAB.

Figure III shows how the coordinates are related to the text window. Be warned – the punctuation used in VDU commands is vital. Get it right or weird things can happen.

Let's see a text window in practice. Clear the screen and enter:

VDU 28,4,38,28,4

You now have a text window, even though nothing appears to have happened. However if you look closely you'll see that the prompt, > is inset. It's at the start of the text window.

Now hold down a key, say

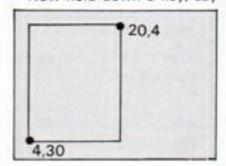


Figure IV: Our first text window

the N key, and see what happens. Instead of the line of Ns going right across the screen as normal they only get so far and then start again on the line below. They're trapped inside the text window.

Figure IV shows the text window and the coordinates that define it.

As soon as you've had enough of the Ns try entering CLS to clear the screen and see what happens. All the Ns – or whatever you used – disappear, but notice that the original:

VDU 28,4,38,28,4

is still sitting up there at the top. Whey hasn't CLS wiped it?

The answer is that CLS only works on the text screen and we've just limited that to a bit of the screen starting 5 lines down from the top. The previous command is still stranded on the first line.

Now this top line is still part of the graphics screen which covers the whole screen area until we issue the appropriate VDU command.

So if there's a keyword corresponding to the text screen's CLS that clears the graphics screen it should get rid of the stranded VDU28 for

Such a command is CLG. Try it and you'll be left with a nice blank screen. Not for long though. Let's draw a line across it with:

DRAW 1279,1023

No doubt we'd get a fortune for it at the Tate. However before you enter the tricky world of conceptualist art notice one thing about the line: It crosses the text window quite happily.

The text window is still there - we've only wiped it, not destroyed it. You'll see this is where we use CLS again.

Now the text screen is cleared and with it goes part of the white line, leaving it split in two. So clearing a text screen

- 18 REM Program I
- 28 MODE 1
- 38 VDU 23,1,8;8;8;8;8;
- 48 xleft=1:yleft=38
- 58 xright=38:yright=1
- 68 FOR loop=1 TO 7
- 78 xleft=xleft+2:yleft=y left-2
- 88 xright=xright-2:yrigh t=yright+2
- 98 VDU 28,xleft,yleft,xr ight, yright
 - 188 COLOUR 128+1000 MOD 4
 - 118 CLS
 - 128 NEXT loop

also gets rid of any graphics that cross it.

The text window is a bit of an elusive beast, isn't it? I mean we can't really see it, can we? This is because its background colour, black, is the same as the graphics screen's background colour. Let's change this with:

COLOUR 129

when a quick CLS will produce a nice red rectangle on screen. That's our text window. We can change the background colour of our graphics window, but this time we have to use GCOL.

It's used in exactly the same way as the COLOUR command with 128 added to the relevant logical colour number. So for a yellow graphics screen background we want GCOL along with 128+2. Try entering:

BCOL 0,130

which appears in the text window - and then clearing the graphics screen with CLG. The result is an almost completely yellow screen.

Notice that now the graphics screen has its revenge, totally swallowing the red of the text screen. All that's left is a forlorn white prompt on a red background at the top of the text screen area.

Give it some encouragement with a quick CLS which will cause the text area to reappear. You'll also see how much faster CLS is compared with CLG.

Try making your own text windows. Don't worry - if you make a mess of things you can always press Break. The more gentle among you may like to know that VDU 26 undoes the effect of VDU 28, setting things back to normal with the text and graphics screens filling the whole display.

Once you've got the hang of how to create text windows and the difference between them and the graphics screen have a look at Program I.

It produces a pattern by creating a text window and

clearing it, defining another window lying wholly inside the first and clearing that one to a different background colour and so on.

Line 30 switches off the flashing cursor while lines 40 and 50 initialise the variables that are used to define successive windows.

The FOR ... NEXT loop of lines 60 to 120 cycles seven times. Each time through, lines 70 and 80 calculate new values for the coordinates which are then used in line 90 to create a new text window. Line 100 picks a fresh background colour after which 110 clears it.

Text windows aren't limited to just making pretty patterns. They can help make displays easier to understand and add a professional touch. Program II shows a text window being used for a message while the rest of the screen is used for graphics.

The text window is set up at line 40. The program then enters an endless REPEAT . . . UNTIL loop. Nested inside this is a FOR . . . NEXT loop which cycles 50 times, drawing a multicoloured star in the process.

When this is done lines 110 and 120 use PRINT to send a message to the screen. This appears neatly in the text

10 REM Program II

28 MODE 1

38 VDU 23,1,8;8;8;8;

40 VDU 28,12,38,28,26

58 REPEAT

68 FOR loop=1 TO 58

78 MOVE 648,612

88 GCOL 8, RND(3)

98 DRAW 648+(-1^RND(2))*

RND (300),612+(-1^RND(2))*RN

100 NEXT loop

118 PRINT *Press spacebar

128 PRINT"for another go"

138 wait=BET

148 CLS

150 UNTIL FALSE

Program II

window under the display. Try moving the window to another area of the screen and see what happens.

You'll find that line 40 is the only one that needs altering. The program now waits until a key is pressed, then clears the text window and carries on. Add:

145 CL8

and see what happens. Do you need line 140 now?

As you've played around with text windows you've probably noticed that they are a great way of producing coloured rectangles on screen. Program III makes use of this to produce five randomly positioned blocks of colour.

The mechanics of the pro-

18 REM Program III

28 ONERROR 60TO 138

38 MODE 1

48 VDU 23,1,8;8;8;8;

50 FOR loop=1 TO 5

68 COLOUR 128+RND (3)

78 leftx=RND(38)

80 topy=RND(30)

98 VDU 28,1eftx,topy+8,1

eftx+8,tapy

100 CLS

110 NEXT loop

120 REPEAT UNTIL FALSE

138 COLOUR 3: COLOUR 128: V

DU 26:CLS

Program III

gram should be fairly straightforward by now. All line 20 does is make sure that when you press Escape to stop the program the screen reverts to normal. It's much subtler than hammering the Break key, isn't it?

One thing about Program III is that the loop cycles five time, but you don't always see five rectangles. Can you explain why? And can you solve the problem?

 By the time vou've done that you'll really understand text windows and be ready for next month when we'll look into some more windows.

430 LDAcou: CMPtime1: BPLsa 1348 LDA&78:STAenemypos 888 LDAxman: CMPxenesy From Page 31 1358 LDA&71:STAenemypos+1 ve1 898 BEQeneav1 10 REM Maze 448 RTS 988 BMIenleft 1368 LDA#2:STA(enemypos),Y 28 REM By S. Merrigan 450 .mm EQUBO:.cou EQUBO 1378 INCxenemy: JMPenemy1 918 BPLenright 38 REM (c) Electron User 1380 .box 460 .leave EQUB0 920 .enemy1 48 ONERRORMODE6: REPORT: P 478 .dead EQUBB 1398 JSRone 938 LDAyman: CMPyenemy RINT" at line ": ERL: END 480 .counter EQUW0: EQUW0 948 BEQeneay2 1400 JSRsecond: JSRthird 50 IFPAGE>&E00 PROCdload 498 . keyco EQUMB 1418 JSRsecond: JSRthird 950 BMIenup :END 500 .map EQUB0 960 BPLendown 1420 JSRsecond: JSRthird 60 MODE4: PROCins: CLS 510 .time EQUW8: EQUW8: EQU 970 .enemy2 1438 JSRsecond: JMPforth **78 REPEAT** Be 988 LDAxenemy: CMPxtople: B 1448 .second 88 ?keyco=1:keyco?1=8:?1 1450 LDA&78: CLC: ADC#&40: ST 520 .time1 EQUW0: EQUW0: EQ PLene1:RTS eave=0:mazey%=0:?map=0:sc%= A&78 **UB8** 998 .ene1 8:1i%=3:?&86=6:?&87=5 538 .so EQUM1: EQUM1: EQUM2 1888 LDAyenemy: CMPytople: 8 1468 LDA&71:ADC#1:STA&71 98 PROCvar: PROCread: PROC 1478 LDY#31:LDA#248 8: EQUW18 PLene2: RTS key: PROCre_spr1 540 .sol EQUN1: EQUN2: EQUN 1818 .ene2 1480 .second1 100 REPEAT: MODES 100: EQUW10 1498 STA(&78) .Y 1828 LDAxbotri: CMPxenemy: B 1500 DEY: BPLsecond1 110 VDU19,0,4;0; 550 .so2 EQUN1:EQUN3:EQUN PLene3: RTS 120 VDU23,1,0;0;0;0; 1518 RTS 100: EQUW2 1030 .ene3 1848 LDAybotri: CMPyenemy: B 130 PROCdraw: PROCre_spr:C 560 .so3 EQUW1:EQUW2:EQUW 1528 .third 1538 LDA#15:LDY#47 100: EQUW1 ALLmaze PLene4: RTS 140 CALLstart 1050 .ene4 1548 .second2 578 .may3 158 IF?dead=2 MODE4: PROCd 1868 LDX#so2 MOD256:LDY#so 580 CMP#0: BEQenup1: JMPene 1550 STA(&78),Y 2 DIV256:LDA#7:JSR&FFF1 1568 DEY: CPY#31 reap my2 168 IF?dead=3 PROClevel:P 1570 BNEsecond2 1878 JSRvduoff: JSRerase: JM 590 .enup1 ROCvar: PROCread: PROCkev: key 680 LDA#8:STA(enemypos),Y Paaze 1588 RTS co?1=8:?leave=8:?eap=8 618 LDA&78:STAenemypos 1888 .enleft 1598 .forth 178 IF?dead=1 PROClive:PR 628 LDA&71:STAenemypos+1 1898 LDAenemypos:STA&78 1688 LDY#47:LDX#15 638 LDA#2:STA(enemypos),Y OCvar 1188 LDAenemypos+1:STA&71 1610 .forth1 180 UNTILli %=8 640 DECyenemy: JMPenemy2 1110 LDA&70: SEC: SBC#1: STA& 1628 LDA&C88,X 198 sc%=sc%+(keyco?1+18) 650 .enup 78 1638 STA(&78) .Y 200 VDU20:CLS: IF sc%>HIX(668 LDAenemypos:STA&78 1128 LDA&71:SBC#8:STA&71 1648 DEY: DEX 5) PROChi 670 LDAenemypos+1:STA&71 1138 LDY#8:LDA(&78),Y 1650 BPLforth1 210 PROChi_sc 688 LDA&78: SEC: SBC#21: STA 1668 RTS 1140 CMP#2: BNEmay1: LDA#1: S 228 UNTILFALSE 1678 .one 470 TAdead: JMPenleft1 230 DEFPROCassemble 698 LDA&71:SBC#8:STA&71 1150 .may1 1688 LDY#15 248 FORI=@TO2STEP2 788 LDY#8:LDA(&78),Y 1168 CMP#8: BEQenleft1: JMPe 1690 .onea 258 PX=QX 718 CMP#2: BNEmay3: LDA#1: S 1788 LDA&C28,Y nemv1 268 COPTI 1170 .enleft1 1718 ORA(&78),Y TAdead: JMPenup1 278 .start 728 .endown 1188 LDA#0:STA(enemypos),Y 1728 STA(&78),Y 288 LDA&87:STAmm 1738 DEY: BPLonea 730 LDAenemypos: STA&70 1198 LDA&78:STAenemypos 1748 LDA#255:LDY#31:LDX#15 298 .start1 748 LDAenemypos+1:STA&71 1200 LDA&71:STAenemypos+1 300 JSRmove 758 LDA&78:CLC:ADC#21:STA 1218 LDA#2: STA (enemypos) , Y 1750 .one1 310 LDA&86:STAcou:JSRsave 478 1228 DECxenemy: JMPenemy1 1768 STA(&78),Y 328 LDAdead: BEQstart2: RTS 768 LDA&71: ADC#8: STA&71 1230 .enright 1770 DEY: DEX 1780 BPLone1 330 .start2 1248 LDAenemypos: STA&78 778 LDY#8:LDA(&78),Y 1258 LDAenemypos+1:STA&71 1798 LDX#15:LDY#47 340 DECas 780 CMP#2: BNEmay4: LDA#1: S 1268 LDA&78:CLC:ADC#1:STA& 350 BPLstart1 TAdead: JMPendown1 1800 .one2 368 LDX#so3 MOD256:LDY#so 78 1818 LDA&C18,X 798 . may4 1270 LDA&71:ADC#8:STA&71 1828 STA(&78),Y 3 DIV256:LDA#7:JSR&FFF1 800 CMP#0: BE@endown1: JMPe 1288 LDY#8:LDA(&78),Y 1830 DEY: DEX 370 JSRenemy neay2 1848 BPLone2 1298 CMP#2: BNEmay2: LDA#1: S 388 JMPstart 818 .endown1 1858 RTS TAdead: JMPenright1 398 . save 828 LDA#8: STA (enemypos), Y 1300 .may2 400 LDA#2:LDX#time MOD256 838 LDA&78:STAenemypos 1860 .erase 1878 LDA#&BF: STA&72 :LDY#time DIV256:JSR&FFF1 840 LDA&71:STAeneaypos+1 1318 CMP#8:BEQenright1:JMP 1888 LDA#&64:STA&73 418 .save1 858 LDA#2:STA(enemypos),Y enegy1 868 INEvenesy: JMPenesy2 1320 .enright1 1898 LDA#8:LDY#144 428 LDA#1:LDX#time1 MOD25 1338 LDA#8: STA (enemypos), Y 6:LDY#time1 DIV256:JSR&FFF1 878 .enemy 1988 LDX#6

1918 .eraser 1920 STA(&72),Y 1938 DEY 1948 BNEeraser 1958 LDA&72:CLC:ADC&&48:ST A&72 1968 LDA&73: ADC#1: STA&73 1978 LDY#144:LDA#8 1988 DEX: BPLeraser 1998 RTS 2888 .man 2818 LDA#&38: STA&72 2020 LDA#&0C: STA&73 2838 LDX#4:LDY#31 2040 .man1 2050 LDA(&72),Y 2060 EOR(&70),Y 2878 STA(&78) . Y 2000 DEY: BPLman1 2090 LDA&72: CLC: ADC#32: STA £72 2188 LDA&78: CLC: ADC#&48: ST A\$78 2118 LDA&71:ADC#1:STA&71 2128 LDY#31:DEX:BPLman1

2138 RTS 2148 .keyhole 2158 LDX#2:LDA#&D8:STA&72 2168 LDA#&BC: STA&73 2178 .key1 2188 LDY#15 2198 LDA&78: CLC: ADC#&48: ST A&78 2200 LDA&71:ADC#1:STA&71 2210 .key2 2228 LDA(&72),Y 2238 EOR(&78),Y 2240 STA(&78),Y 2250 DEY: BPLkey2 2268 LDA&72: CLC: ADC#16: STA £72 2270 DEX: BPLkey1 2288 RTS 2298 .key LDX#2:LDA#&14:ST A&72 2388 LDA#&89:STA&73 2318 .keys LDY#31 2328 .keys1 2338 LDA(&72),Y 2348 EDR(&78),Y 2350 STA(&78), Y: DEY: BPLkey

2368 LDA&72: CLC: ADC#32: STA

2378 LDA&78: ADC#&48: STA&78

2388 LDA&71:ADC#1:STA&71

2400 . move LDA#1:STA&84

2390 DEX: BPLkeys: RTS

51

£72

Maze Man

Score -0

Keys -0:2
Lives -3

apso: JMPleft1

2418 LDA#129:LDY#&FF:LDX#& 9E: JSR&FFF4: CPY#8: BEQaove2: JMP1eft 2428 .move2 LDA#129:LDY#&F F:LDX#&BD:JSR&FFF4:CPY#8:BE Qmove3: JSRright 2438 .move3 LDA#129:LDY#&F F:LDX#&B7:JSR&FFF4:CPY#8:BE Qaove4: JMPup 2448 .move4 LDA#129:LDY#&F F:LDX#&97:JSR&FFF4:CPY#8:BE Qmove5: JSRdown 2458 .move5 LDAmap:CMP#1:B NEmove6:LDA#129:LDY#&FF:LDX #&9D: JSR&FFF4: CPY#0: BEQmove 6:LDA#2:STAdead 2468 .move6 DEC&84: BEQmove 7:RTS 2478 .move7 LDA#6:STAcou:J MPsave 2480 .left LDAmanpos:STA&7 2498 LDAmanpos+1:STA&71 2500 LDA&70: SEC: SBC#1: STA& 78

2518 LDA&71:SBC#8:STA&71

2538 BED1eft1:CMP#5:BNEned

:LDAleave: CMP#1: BNEned:LDA#

2548 .ned CMP#4: BNEgo: JSR#

2528 LDY#8:LDA(&78),Y

3:STAdead:JMPleft1

2550 .go CMP#3:BE@got:JMP# ove3 2568 .got JSRerkey:LDY#8 2570 .left1 INC&84 2580 DECxman: DECxtople: DEC xbotri 2598 LDA#8:STA(manpos),Y 2688 LDAmanpos: SEC: SBC#1:S TAmanpos 2618 LDAmanpos+1:SBC#8:STA eanpos+1 2628 LDApointer:SEC:SBC#1: STAppointer 2638 LDApointer+1:SBC#8:ST Appinter+1 2648 LDA#2:STA(manpos),Y 2650 JSRvduoff: JSRerase: JS Reaze: JMPsove3 2660 .right LDAmangos:STA& 2678 LDAmanpos+1:STA&71 2680 LDA&70:CLC:ADC#1:STA& 78 2698 LDA&71:ADC#8:STA&71 2788 LDY#8:LDA(&78),Y 2718 BERright1: CMP#5: BNEne d1:LDAleave:CMP#1:BNEned1:L DA#3:STAdead:JMPright1 2720 .ned1 CMP#4:BNEgo1:JS Rmapso: JMPright1

2730 .gol CMP#3:BEQgot2:RT 2740 .got2 JSRerkey:LDY#0 2750 .right1 INC&84 2768 INCxman: INCxtople: INC xbotri 2778 LDA#8: STA(manpos), Y 2788 LDAmanpos: CLC: ADC#1:S TAmanpos 2798 LDAmanpos+1:ADC#8:STA manpos+1 2886 LDApointer:CLC:ADC#1: STAppointer 2818 LDApointer+1:ADC#8:ST Appinter+1 2828 LDA#2:STA(manpos),Y 2838 JSRvduoff: JSRerase: JM Peaze 2848 .up LDAmanpos:STA&78 285@ LDAmannos+1:STA&71 2868 LDA&78: SEC: SBC#21: STA 278 2878 LDA&71:SBC#0:STA&71 2880 LDY#8:LDA(&78),Y 2890 BEQup1 2988 CMP45: BNEned2: LDAleav e: CMP#1: BNEned2: LDA#3: STAde ad: JMPup1

2918 .ned2 CMP#4: BNEgo2: JS

Rmapso: JMPup1 2920 .go2 CMP#3:BEQgot3:JM Pagve5 2930 .got3 JSRerkey:LDY#8 2948 .up1 INC&84 2950 DECyman: DECytople: DEC ybotri 2960 LDA#0:STA(manpos),Y 2978 LDAmanpos: SEC: SBC#21: STAmanpos 2980 LDAmanpos+1:SBC#0:STA manpos+1 2998 LDApointer: SEC: SBC#21 :STApointer 3000 LDApointer+1:SBC#8:ST Appinter+1 3818 LDA#2:STA(manpos),Y 3828 JSRvduoff: JSRerase: JS Rmaze: JMPmove5 3030 .down LDAmanpos:STA&7 3848 LDAmanpos+1:STA&71 3050 LDA&70:CLC:ADC#21:STA \$78 3060 LDA&71: ADC#0: STA&71 3878 LDY#8:LDA(&78),Y 3080 BEQdown1 3090 CMP#5: BNEned3:LDAleav e: CMP#1: BNEned3: LDA#3: STAde ad: JMPdown1 3180 .ned3 CMP#4: BNEgo3: JS Rmapso: JMPdown1 3118 .go3 CMP#3:BEQgot4:R TS 3120 .got4 JSRerkey:LDY#8 3130 .down1 INC&84 3140 INCyman: INCytople: INC ybotri 3150 LDA#0:STA(manpos),Y 3168 LDAmanpos: CLC: ADC#21: STABanpos 3178 LDAmanpos+1: ADC#8: STA 3188 LDApointer:CLC:ADC#21 :STApointer 3198 LDApointer+1:ADC#8:ST Apointer+1 3280 LDA#2:STA(manpos),Y

3270 .maze4 LDA#1:STAcount er+3: JSRmaze1 3288 LDA&78: CLC: ADC#21: STA £78 3298 LDA&79: ADC#8: STA&79 3300 DECcounter: BPLmaze4:L DY#3 3318 .vduon LDA#19:JSRo 3320 TYA: JSRo: JSRo 3338 LDA#8: JSRo: JSRo: JSRo 3348 DEY: BNEvduon 3350 JMPline 3360 .mazel LDYcounter+3:L DA(&78),Y 3370 BEQmazeo 3380 LDYcounter+1 3398 LDX&908, Y: STX&78 3488 LDX&981,Y:STX&71 3418 CMP#1: BNEmaze3: JSRbox :JMPmazeo 3428 .maze3 CMP#2:BNEmaze2 : JSRman: JMPmazeo 3430 .maze2 CMP#3: BNEmac: J SRkey: JMPmazeo 3448 .mac CMP#4: BNEmazie: J SRdr map: JMPmazeo 3450 .mazie CMP#5: BNEmazeo :JSRkeyhole 3460 .mazeo INCcounter+3 3478 INCcounter+1: INCcount 3488 LDAcounter+1:CMPcount er+2 3490 BNEmazel .3500 LDAcounter+2:CLC:ADC #6:STAcounter+2 3518 RTS 3528 .vduoff LDY#3 3538 .vduoff1 LDA#19:JSRo 3548 TYA: JSRo 3550 LDA#4:JSRo 3560 LDA#0:JSRo:JSRo:JSRo 3578 DEY: BNEvduoff1:RTS 3588 .line LDA#25:JSRo:LDA #4: JSRo 3598 LDA#248: JSRo: LDA#8: JS 3688 LDA#96: JSRo: LDA#2: JSR 3618 LDA#25: JSRo: LDA#5: JSR 3628 LDA#184: JSRo: LDA#1: JS 3638 LDA#192: JSRo: LDA#2: JS Ro 3648 LDA#25: JSRo: LDA#4: JSR

3658 LDA#128: JSRo: LDA#2: JS

3668 LDA#228: JSRo: LDA#1: JS 3678 LDA#25: JSRo: LDA#5: JSR 3680 LDA#64: JSRo: LDA#3: JSR 3698 LDA#64: JSRo: LDA#2: JMP 3700 .erkey INCkeyco+1 3718 LDAkeyco+1:CMPkeyco:B NEerkey1:LDA#1:STAleave 3728 .erkey1 LDA#31:JSRo:L DA#12:JSRo:LDA#23:JSRo 3738 LDAkeyco+1:CLC:ADC#48 : JSRo 3748 LDX#so MOD256:LDY#so DIV256:LDA#7:JMP&FFF1 3750 .dr_map LDA0&09:STA&7 3768 LDA#&74:STA&72 3778 LDX#1:LDY#31 3788 LDA&78: CLC: ADC#458: ST A&78 3798 LDA&71:ADC#1:STA&71 3800 .dr_map1 LDA(&72),Y 3818 EOR(&78),Y 3828 STA(&78),Y 3838 DEY: BPLdr map1 3848 LDA&72:CLC:ADC#32:STA **&72** 3850 LDA&70:ADC#&40:STA&70 3868 LDA&71:ADC#1:STA&71 3878 LDY#31:DEX:BPLdr_map1 :RTS 3888 .mapso LDA#&38:STA&78 3898 LDA#&7A:STA&71 3988 JSRdr_map:LDA#1:STAma 3918 LDX#so1 MDD256:LDY#so 1 DIV256:LDA#7:JSR&FFF1:LDY #8: RTS 3920 1: NEXT: ENDPROC 3938 DEFPROCdraw 3940 GCOL0.3:FORIX=1T024ST 3950 JX=1X/2 3968 MOVE16+1%, 8+J%: DRAW12 63-J%, 8+J%: DRAW1279-I%, 8+J% :DRAW1279-IX,1815-JX:DRAW12 63-IX,1823-JX: DRAW16+IX,182 3-J%: DRAW8+I%, 1815-J%: DRAW8 +IZ,8+JZ:DRAW16+IZ,8+JZ 3970 NEXT 3988 GCOL8,1: MOVE248,688 3998 DRAW248,476: DRAW632,4

76

4888 DRAW832,576: DRAW832,7

4818 DRAW448,784: DRAW248,6 4020 COLDUR3 4838 PROCa(5,23, "Keys -") :PRINTTAB(12,23);keyco?1;" ":?keyco 4848 PROCa(5,21, "Score -") 4858 PRINTTAB(12,21);sc% 4868 PROCa(5,25, "Lives -") 4070 PRINTTAB(12,25);11% 4888 PRINTTAB(6,3);:PROCb("Maze Man") 4898 PROCa(6,5,"----") :6COL0,1 4188 IF?map=1 CALLmapso 4110 ENDPROC 4120 DATA&3FFFFE,&30F786,& 266332,&2F367A,&2F007A,&263 E32,&38A286,&382A8E,&2BEBEA ,428882A,423FFE2,428882A,42 BEBEA, &382A8E, &38A286, &263E 32,&2F007A,&2F367A,&266332, &38F786,&3FFFFE 4130 DATA&3FFFFE, &200002, & 2FF7FA, &28148A, &2BC1AA, &2BF FAA,&2A88AA,&2AFEAA,&2A42AA ,&2B5AAA,&2252A2,&2ADEAA,&2 A48AA,&2B7FAA,&2B112A,&2BC4 6A, &2BFFEA, &28000A, &2FF7FA, 4200002, 43FFFFE 4148 DATA&3FFFFE, &200002, & 2D5BBA,&25498A,&2D593A,&25C 922,&248922,&2C993A,&200002 .&3FFFFA,&22288A,&2AA88A,&2 2288A,&2AA88A,&2AABFA,&28BA 8A,&2AAAAA,&2AAAAA,&2AAAAA, &2228A2,&3FFFFE 4158 DEFPROCread 4168 RESTORE (4128+mazey%) 4178 FORIX=8T028:READAX:F0 RJX=1T021:AX=AXDIV2:?(mazeX +II*21+JI) =AIMOD2: NEXT, 4188 RESTORE4218 4198 FORIX=8TO17:READAX: IX 2&988=AX: NEXT 4200 ENDPROC 4218 DATA&E8, &64, &88, &65, & 28.465.418.466.438.466.458. \$66, \$48, \$67, \$68, \$67, \$88, \$67 4220 DATA15,15,15,15,15,14 ,12,8,15,14,12,8,8,8,8,8 4238 DATA255,255,255,255,2 39,287,143,15,239,287,143,1 5, 15, 15, 15, 15 4248 DATAB, 8, 8, 8, 17, 51, 119 ,255,17,51,119,255,255,255, 255,255

3210 JSRvduoff: JSRerase: JM

3228 .maze LDApointer:STA&

3230 LDApointer+1:STA&79

3248 LDA#2:STAcounter

3250 LDA#8: STAcounter+1

3268 LDA#6:STAcounter+2

Peaze

78

4258 DATAB, 8, 8, 8, 8, 8, 8, 8, 8 ,8,8,8,8,8,17,51,8,8,8,8,8,8, 0,238,236,8,8,8,8,8,8,8,8,8 4260 DATAR, 8, 8, 8, 8, 8, 8, 8, 3 ,7,39,7,22,3,183,15,62,38,9 4,38,158,63,127,15,128,128, 128, 128, 8, 136, 288, 192 4278 DATA 16,1,33,3,67,22, 22, 22, 15, 15, 15, 75, 195, 131, 1 31,3,15,15,15,45,60,60,60,6 8, 192, 72, 184, 44, 68, 22, 22, 22 4288 DATA8, 8, 8, 8, 8, 17, 1, 1, 3,67,7,7,143,158,68,68,61,6 2,38,38,38,23,3,3,8,8,8,8,8,2 84,288,72,72 4298 DATAS, 8, 8, 8, 8, 16, 3, 3, 60,60,60,60,60,60,60,44,3,3 ,3,3,3,3,3,192,192,192,19 2,192,224,44,44 4300 DEFPROCre spr 4318 RESTORE4228 4328 FORIX=8T0255: READAX: I 17&C00=AZ: NEXT 4338 ENDPROC 4348 DEFPROCre_spr1 4358 RESTORE4448 4368 FORIX=8T0159: READAX: I 1?4914=AZ: NEXT 4378 ENDPROC 4388 DATA51,183,71,71,71,7 1,183,51 4390 DATA238,63,31,31,31,3 1,63,110 4488 DATA17,17,17,17,17,17 ,58,58 4418 DATA76,76,196,196,196 ,196,226,226 4428 DATA58,58,58,116,116, 116,116,51 4438 DATA226,226,226,241,2 41,241,241,238 4448 DATA8,8,8,8,8,8,8,8 4450 DATA0,8,8,0,8,8,8,8 4468 DATAB, 8, 8, 8, 8, 8, 8, 8 4478 DATA8,8,8,8,8,2,7,38 4488 DATA 8,3,22,118,118,1 83,127,255 4498 DATAB, 8,6,12,237,253, 4500 DATA1, 17, 17, 29, 89, 219 ,159,255 4518 DATA188,252,244,244,2 44,244,244,24 4528 DATA255,255,119,8,8,8 ,8,8 4538 DATA255, 255, 255, 0,0,0 .0,0 4548 DATA255, 255, 255, 17, 17



.17.17.8 4558 DATA244, 244, 244, 244, 2 44,108,204,136 4568 DEFPROCKey: IF?keyco(9 ?keyco=?keyco+1 4578 mazeX?24=2: mazeX?212= 4588 IFaazey%=8 aaze%?158= 5 ELSE maze%?200=5 4598 FORIZ=1TO?keyco 4688 XZ=RND (448) 4618 IFmazeX?XX()8 60T0468 @ ELSE mazeX?XX=3 4628 NEXT 4630 XX=RND (440) 4648 IFmazeX?XX(>8 80T0463 @ ELSE mazeX?XX=4 4658 ENDPROC 4668 DEFPROCdraap: SOUND1,1 ,100,10 4678 VDU19,1,4;8;8;8;:VDU1 9,8,3;8;8;8; 4680 VDU23,224,0,8,8,8,8,8,8 ,0,0 4698 VDU23,225,255,255,255 ,255,255,255,255,255 4788 VDU23,226,24,68,24,12 6,153,36,36,36 4710 VDU23,227,0,2,5,253,1 4728 VDU23,229,24,68,68,24 ,68,68,126,126 4738 VDU28,8,31,28,4 4748 FORIX=mazeX+1TOmazeX+ 441: VDU224+?IX: NEXT 4758 ?dead=0:PRINT''TAB(5) : "PRESS SPACE": REPEATUNTILI

NKEY-99: ENDPROC

4768 DATAB, 8, 8, 8, 16, 48, 97,

218 4778 DATA8,8,8,8,176,185,2 10,180 4788 DATA8, 8, 8, 8, 112, 225, 2 18,188 4798 DATA8, 8, 8, 8, 112, 225, 1 95,135 4888 DATA253, 175, 175, 175, 1 75,142,140,136 4818 DATA191,175,175,175,1 91,175,175,178 4828 DATA191,175,175,175,1 91,175,175,178 4838 DATA143,143,143,142,1 40,8,0,6 4840 DEFPROClevel 4850 CLS:PROCcls:PROCcls 4860 mazey%=mazey%+10 4878 IFmazey%=30 mazey%=0 4888 scl=scl+(?keyco+18) 4898 IFRND(3)=1 ?&87=?&87-1: IF?&87(2 ?&86=2 4988 IFRND(6)=1 ?&86=2:?&8 6=?&86-1: IF?&86<2 ?&86=2 4918 ENDPROC 4928 DEFPROCVAR 4938 ?476=(maze%+1) MOD256 4948 ?&77=(maze%+1) DIV256 4958 7474=(mazeX+24) MOD25 4968 ?475=(maze%+24) DIV25 4978 ?&7E=(maze%+212) MOD2 4988 ?&7F=(maze%+212) DIV2 56 4998 ?xenemy=2:?yenemy=11 5000 ?dead=0

5818 ?xman=3:?yman=2

5838 ?xbatri=4:?ybatri=3 5040 maze%?24=2 5858 ENDPROC 5868 DEFPROCCIS 5070 FORIX=0TO10: SOUND1,3, 88+IX+4,1:VDU28,1+IX,19+IX, 19-1%,12-1%: COLOUR128+1%: CL S: COLOUR128+IX+1: CLS: K=INKE Y3: NEXT 5880 FORIX=10TO0STEP-1:SOU ND1,2,88+IX+4,1:VDU28,1+IX, 19+1%, 19-1%, 12-1%: COLOUR128 +IX: CLS: COLOUR128+IX+1: CLS: K=INKEY3:NEXT 5090 VDU20,26:CLS 5100 ENDPROC 5110 DEFPROCh (A\$):FORIX=1T DLEN AS: ?&98=ASC (MID\$ (A\$, IX .1)):AX=18:XX=498:YX=8:CALL &FFF1:FORJ%=8T01:VDU23,225: FORKX=2T09: VDU?(&98+4*JX+KX DIV2): NEXT: VDU225, 18,8: NEXT :VDU11,11,9:NEXT:ENDPROC 5120 DEFPROCa(AX, BX, A\$):PR INTTAB (AZ, BZ); A\$: VDU5: MOVEA %*64-8.1816-B%*32:PRINTA\$:V DU4: ENDPROC 5130 DEF PROChi: VDU19,3,4, 8;8;8; 5148 COLOUR2: GCOL8,3 5150 PROCa(0,5, "YOU ARE IN THE TOP 5") 5160 COLDUR2: GCOL0, 1: PROCa (8.6, "-----5170 COLOUR2: PROCa (5, 10, "E NTER NAME") 5188 COLOUR1: PROCa (5, 13, "------*) 5198 COLOURS: INPUTTAB(5,12 5200 S\$=LEFT\$(S\$,10):HI\$(7)=S\$:HIX(7)=scX 5210 FORI=5TO1STEP-1 5228 IFHIX(7)>HIX(I) HIX(I +1)=HIX(I):HI\$(I+1)=HI\$(I): HIX(I)=HIX(7):HI\$(I)=HI\$(7) 5238 NEXT: CLS: ENDPROC 5240 DEFPROChi_sc 5250 COLOUR2 5268 PRINTTAB (5,2);:PROCb ("HI SCORES") 5270 PROCa(5,4,*-- -----

5020 ?xtople=2:?ytople=1

5280 FORI=4T020STEP4 5298 PROCa(1,5+1,STR\$(1/4) +".") 5388 COLDUR2: GCOL0.3 5318 PROCa(4,5+1,HI\$(1/4)) 5320 SCOL0,1

5338 PROCa(15.5+I,STR\$HIX(1/4))

5348 NEXT: COLOUR2: VDU19.3. 5,0;0;0;

5350 PRINT 'SPC (4) :: PROCb ("Press Space")

5360 REPEATUNTILINKEY-99:C

LS: ENDPROC 5378 DEFPROCLive

5380 FORI=170T0100STEP-20

5390 CALLsave: SOUND1,-15, I

5480 NEXT: CALLsave

5418 CLS: PROCcls: PROCcls

5428 li %=li %-1

5430 ?dead=0

5448 ?((?&75+256)+?&74)=8

5458 ?((?&7F+256)+?&7E)=@

5468 ENDPROC

5470 DEFPROCinit

5480 DIMHIX(7): DIMHI\$(7)

5490 FORI=1T05:HIX(I)=(5-I

) #28: HI\$(I) = "STEVIE": NEXT

5500 maze%=&A00

5510 DIMQ% 1800

5528 xman=&7A:yman=&7B:xen

emy=&7C:yenemy=&7D

5530 enemypos=&7E:manpos=&

74:pointer=476

5540 xtople=&80:ytople=&81 5558 xbotri=&82:ybotri=&83

: o=&FFEE

5568 ENVELOPE1,1,28,18,48, 18,38,18,126,8,8,-126,126,1

5578 ENVELOPE2.1,188,-28,1 8,188,15,38,126,8,8,-126,12 6,126

5588 ENVELOPE3.1.5.-5.5.3. 6,9,126,8,8,-126,126,126

5598 ENDPROC

5600 DEFPROCINS: VDU23,1,0; 8;8;8;

5618 VDU19,1,3,0;8;8;:VDU1 9.8.4.8:8:8:

5628 PRINTTAB(16,1);:PROCb ("MAZE MAN")

5638 DRAW1279,8: DRAW1279,1 823: DRAWB, 1823: DRAWB, 8: MOVE 8.916: DRAW1279,916

5648 VDU28,1,38,38,4

5650 PRINT You are an adve nturer lost in a maze. """I he way to escape to the nex t maze is"""to collect all the keys and take them"" to the keyhole at the centr e. There is"

5668 PRINT' a guardian who will seek to destroy"'" you and must be avoided. On ly 1/49th"" of each maze i s displayed at a time. ""T o see the complete maze you

must find"'"the map and pr ess the SPACE BAR. "'"Your controls are-

5678 PRINT'TAB(8)"Z - left X - right "'TAB(8) ": -

/ - down"

568@ PROCinit:PROCassemble :SOUND1,1,100,10

5698 PRINT'TAB(14)::PROCb(*PRESS SPACE*)

5788 REPEATUNTILINKEY-99:E NDPROC

5718 DEFPROCHIoad

5728 *KEY8 *T. : MFORA%=PAGE

TO TOP STEP4: ! (&E08+AZ-PAS E) = !AX: NEXT: PA. = & E08! MOLD! M

RUNIN 5738 +FX138,8,128

5748 ENDPROC

This listing is included in this month's cassette tape offer. See order form on Page 53.

TWO WAYS TO ENSURE YOU GET



EVERY MONTH

- Complete and mail subscription form on Page 53.
- Hand this form to your newsagent.

Please reserve me a copy of Electron User magazine every month until further notice.

□ I will collect

I would like it delivered to my home.

Name _ Address

Note to newsagent: Electron User should be obtainable from your local wholesaler, or contact Tony Walsh, Circulation Manager on 0424 430422

199 ELEC

ATTLEZONE 2000

FRENCH ON THE RUN DHAN EMPIRE STOLEN LAHR 2.50

ARROW OF DEATH BUSINESS GAMES CASTLE OF RIDDLES CREATIVE GRAPHICS

DESK DIARY EARLY VISIT ESCAPE FROM PULSAR 7 FIRST NUMBERS FORTH FREE FALL

GOLDEN BATON GRAPHS AND CHARTS KNOW YOUR TABLES HOPPER

LISP MY MICRO
O LEVEL CHEMISTRY
O LEVEL MATHS
O LEVEL PHYSICS
O/A LEVEL PHYSICS
PADDINGTON'S DISAPP, INK PADDINGTON SHOPPING HIX PAUL BANIEL'S MAGIC SHOW PERSEUS AND ANDROMEDA PERSONAL MOMEY MAMAGE PHILOSOPHER'S QUEST

PLANETOID SNAPPER SPHINX ADVENTURE STARSHIP COMMAND STARTER PACK 1 STARTER PACK 2 SUPER PASCAL

TEN LITTLE INDIANS TIME MACHINE

> I enclose cheque/PO. for £ Access/Visa/Diners Mycredit.cardnumber is:

ADDRESS

SIGNATURE

COMPUTER:

THEE OF KNOWLEDGE WAX WORKS WHAT'S THE TIME? WIZARD OF AKTRZ **WORKSHOP** 2.95 30 BOHS ALLEY BLITZKRIEG

ADVENTURE AUF WIEDERSEHEN PET! BANDITS AT 3 O'CLOCK SUMPLESEE CATERPILLA CHESS. CROAKER CYBERTRON MISSION DANGER UND ELECTRON INVADERS ESCAPE HOONBASE ALPHA FELIX AND FRUIT MONSTERS FELIX IN THE FACTORY FIRST MOVES (CHESS) FIVE-A-SIDE SOCCER FRENZY SALACTIC COMMANDER GAUNTLET GHOULS GOLF GUNSHOKE HYPER DRIVE

KILLER GURILLA MODNRAIJER PHARCAH'S TOMB POSITRON RUBBLE TROUBLE STOCK CAR STRATO SOMSER SUPER POOL

THUATERS

JET POWER JACK KAMIKAZE

To AGF , Dept ELL 26 Van Gogh Place, Bognor Regis, West Sussex

payable to AGF Direct Mail Discou

Telephone (0243) 823337 ag

POSTCODE

CHUCKIE EGG CRIME & DETECTION (2 TAPES) CYCLONE ATTACK DATING CAME (2 TAPES) ENGLISH HISTORY GUIZ (2 TAPES) SEND FOR OUR HOPPER (ROM)
I DO (2 TAPES)
MUSIC QUIZ (2 TAPES)
PCW GAMES COLLECTION

CATALOGUE ROYAL QUIZ (2 TAPES) SCIENCE QUIZ (2 TAPES) SNOOKER THEATRE GULZ (2 TAPES)

4.95 HAGIC MUSHROOM ROBOTRON 5.75

HICRO-OLYMPICS MINI OFFICE THAI BOXING 747 SUMPER BUNDLE JET BOOT JACK OVERDRIVE SMASH GRAB 6.50 STEVE DAVIS SHOCKER HAPPY WRITING 6.99

FOOTBALL MANAGER 7.29 BEACH HEAD COMPUTER HITS 10 GAMES DEATHSTAR GREEDY DWARF REPTON

TALES OF ARABIAN NIGHTS TEMPEST VOL. 2 COMPUTER HITS WAY OF THE EXPLOSING FIST ODD 2 THE EXPLOSING FIST ODD 2 THE EXPLOSING FIST ODD 2 THE EXPLOSING FIST ODD 3 THE EXPLOSION FIST OD 3 THE EXPLOSION FIST ODD 3 THE EXPLOSION FIST ODD 3 THE EXPLOSIO BBC/Elec.



2,50

+20pP+P

EMPIRE

PARAS, BATTLEZCHE 2000, JOHNNY REB, STOLEN LAN EMPIRE & ROMAN EMPIRE.

60 ELECTRON USER August 1986

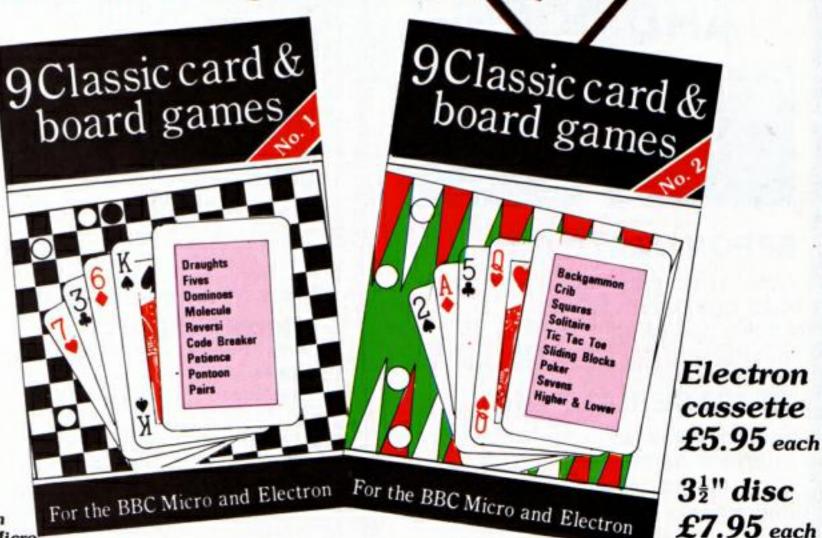


Electron

cassette

can also be used on

the BBC Micro



TO ORDER, PLEASE USE THE FORM ON PAGE 53

ELECTRON SOFTWARE BARGAINS from POTTER PROGRAMS 'THE HOTTER PROGRAMS'

Send a S.A.E. for our full list of cut-price software for the Electron, which includes the Big value Computer Hits 10 and Computer Hits 10 Vol 2 from Beaujolly, as seen on T.V. for our fully inclusive price of only £8.45 each.

All our games are original and in stock at time of advertising, so order today and avoid delay. Orders outside the UK please add £1.00 per tape.

Also available direct from Potter Programs our fiendish adventure games.

* NEW RELEASE - THE TWIN ORBS OF AALINOR

One hundred per cent machine code and data compression and interactive characters. Can you recover the lost Orbs of Aalinor and harness their potent power?

NOT AVAILABLE AS PART OF OUR SPECIAL OFFER Price: £3.95 + 50p p&p

* NEW RELEASE - RETURN OF FLINT 32K

The sequel to the very popular SUPER AGENT FLINT. As the Super Agent you have successfully docked your captured rocket with the British Space Station, only to find that it has been infiltrated by the dastardly T.E.R.D. organisation. This is where your mission begins. Price: £2.95

THE STAFF OF LAW 32K

Can you track down the Staff of Law and master its potent Earth Power to defeat the Despiser? "Extremely fiendish ... well worth buying" Electron User. Price

SUPER AGENT FLINT 32K

The dreaded T.E.R.D. (Terrorist for England's Ruin and Destruction) organisation has reared its ugly head. Only you as Super Agent Flint can capture their interstellar rocket and secret plans. "Quite fast and fun to at the price I must recommend it" Electron User Price £2.95

GALADRIEL IN DISTRESS 32K

The Princess Galadriel has been abducted and an evil spell holds her prisoner. You must seek aid from the Wise Lore Master to release her and save yourself from the wrath of King Theoden. Price £2.95

All adventures with full save game facility for the Electron or BBC B. Price £2.95 each OR SPECIAL OFFER: Any three games for £5.95 OR ALL FOUR games for only £7.95. Please add 50p P&P per order (£1.00 for orders outside UK). Also hint sheets available 20p each game

Send cheque or P.D. with your order to:

Dept E14, Potter Programs, 7 Warren Close, Sandhurst, Camberley, Surrey GU17 8JR. Tel: 0252 877608.

ADVERTISERS' INDEX

| 21st Software | | | | | | *** | 2 |
|------------------|--------|-------|-----|-----|----|------|------|
| A.G.F | 1 | | | | | - | 60 |
| Advanced Comp | | | cts | | | 8 | & 9 |
| Andyk | | | | | | | 62 |
| C & F Associates | | | | | | | 43 |
| Cambridge Univ | ersity | Press | 3 | | | | 62 |
| Expander | | | | | | | 62 |
| Golem | | | | | | 477 | 62 |
| Holl-Soft | Terr | | | | | *** | 36 |
| P.M.S | | | | | | | 7 |
| Potter Programs | 3 | | | | | | 36 |
| Qualsoft | | | | | | | 30 |
| Robico Software | 9 | | | | | | 28 |
| Slogger | | | *** | | 23 | .248 | 4 25 |
| Superior Softwa | | | | | | | 64 |
| Voltmace | | | | *** | | | 12 |

ELECTRON EPROMPLUS

SIDEWAYS ROM UNIT FOR THE ELECTRON !!

Using this Superb ADD-DN for the Acorn Electron with PLUS 1 expansion you can fit up to 4 ROMS/EPROMS (8 with 2 units fitted) which will then be available at the flick of a switch.

The EPROM PLUS plugs into either of the expansion sockets of the PLUS 1, and will accept 8K or 16K ROMS/EPROMS. The facility to POWER-UP into whichever ROM is selected, or BASIC if required, is a useful feature of the unit.

An added bonus is that many of the ROMS available for the 'Beeb' will also run on the Electron, offering another world of software.

ORDERING: One EPROM PLUS Unit £14.95 Two EPROM PLUS Units £27.95 Please add £1.00 P&P

SPECIAL

Two EPROM PLUS Units ONLY £24.45 + P&P

EXPANDOR SYSTEMS

99 Staley Hall Road, Stalybridge, Cheshire SK15 3DP. Tel: 061-303 7646 Tel: 061-747 5688

ANDYK Ltd.





EPROM CARTRIDGE

Able to take application software. Also one or two ROMs. Allows use of utility ROMS. Plugs £9.99 + £1 P&P into Plus 1:

RS423 SERIAL PORT

Has drive capability and software interface as the BBC Model 'B', plugs directly into Plus 1 cartridge £34.99 + £1 P&P slot. Price:

(as used by CBS News)



58 BARK LANE, WESHAM LANCASHIRE PR4 3HG. TEL: (0772) 682658

Astronomy With Your Personal Computer

PETER DUFFETT-SMITH

For any amateur astronomer or computer enthusiast, this guide provides an invaluable collection of 26 sub-routines for use in astronomy, written in a portable version of BASIC, which can be varied and combined to cover most problems. The book gives all the details whilst the discs contain the programs from the book in an easily accessible form suitable for BBC(B) and IBM PC machines.

258 pp. 1985 0 521 26620 3 Hard covers £25.00 net Paperback £8.95 net 0521319765 0 521 32144 1 BBC(B) Disc £12.50 incl. VAT in UK 0 521 32145 X IBM PC Disc &12.50 incl. VAT in UK

Fun Mathematics on Your Microcomputer

Software pack for Acorn Electron/BBC Micro

CZES KOSNIOWSKI

This package consists of a copy of the successful book of the same title together with two software cassettes. The cassettes contain versions of the programs in the book, specially adapted for the Acorn Electron and BBC Micro.

"... the book is a delight. It gives plenty of ideas for the general programmer as well as for the 'pure' mathematician.'

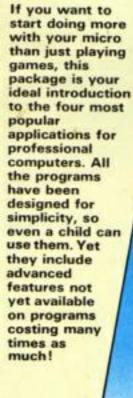
Computers in Schools

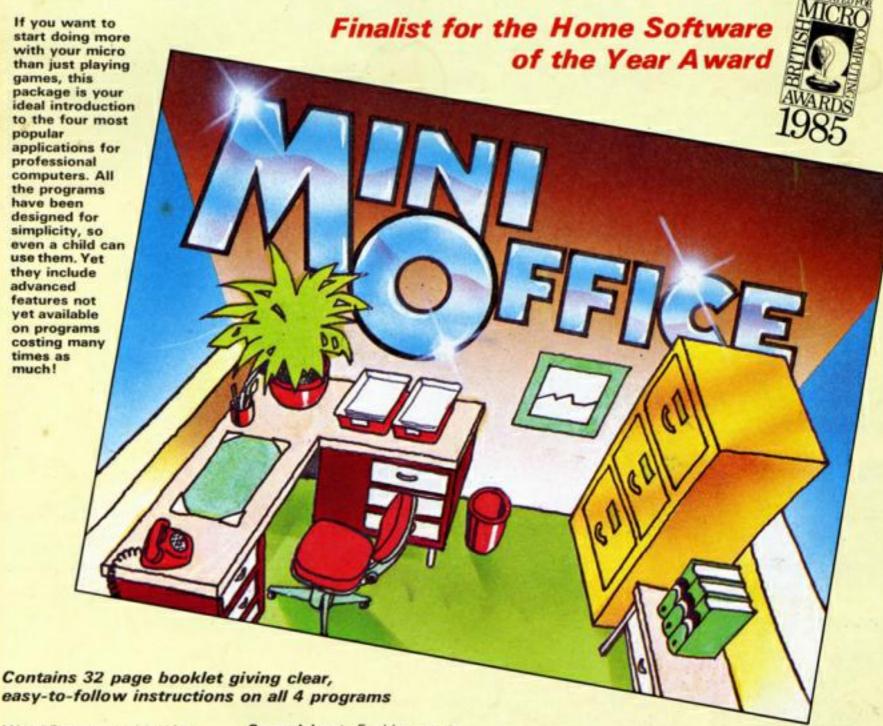
052130119 X Software pack £11.50 incl. VAT in UK

For further details of all Cambridge Computer Science (and Astronomy!) titles, please write to Sally Seed at the address

Cambridge University Press

The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU





Word Processor: Ideal for writing letters and reports. There is a constant display of both time and word count, plus a words-per-minute display to encourage the budding typist! A unique feature is the double-size text option in both edit and printer mode - perfect for young children and people with poor vision.

Database: You use this for storing information, just like an office filing cabinet. Facts you have entered can be quickly retrieved by just keying in a word or part of a word. They can be sorted, replaced, saved for future use or printed

Spreadsheet: Enables you to use your micro for home accounts or pocket money records. It creates a display of numbers in rows and columns. Continuous updating is possible, and a changed figure can be instantly reflected throughout the rest of the spreadsheet. Your results can be saved, to be used for future updates, or can be fed into its associated program . .

Graphics: Part of the spreadsheet section, it lets you draw bar charts, pie charts and histograms to give a graphic presentation of your statistics. Helps to give life and colour to the dullest figures!

☆ Word Processor ☆ Spreadsheet **☆** Database

☆ Graphics

Now they're all together in ONE simple package

Four full-scale programs for an incredible low, low price! cassette

Also available from:

BOOTS COMET CURRYS DIXONS WHSMITH

Greens RUNBELOWS GREETING and other computer stores

